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THE IRON AGE

A Review of the Hardware, Iron, Machinery Trades.

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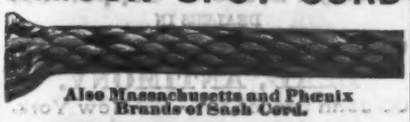

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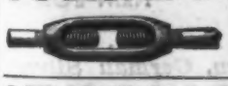

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On
PAGE 25
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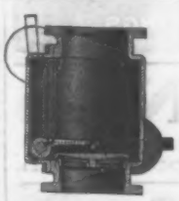

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SEE PAGE 27.

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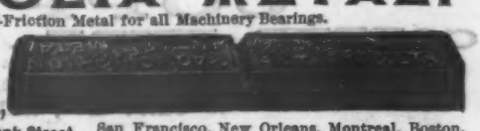

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THE IRON AGE

THURSDAY, MARCH 17, 1904.

The Terry Steam Turbine.

A new form of steam turbine has recently been patented which resembles in a measure the familiar Pelton water wheel, in that the force producing rotation is directed tangentially to the periphery of the wheel, completely avoiding the end thrust present in all forms through which the steam passes parallel to the axis. It differs from the Pelton wheel, however, in that the velocity of the moving fluid is not all absorbed in a single impact or on a single bucket. The buckets on the wheel are confronted by similar stationary buckets, or reversing chambers, as they are called, which return the steam to the wheel after each rebounding until all its effective energy has been abstracted. This briefly is the fundamental principle of this new turbine as invented by Edward C. Terry of Hartford, Conn.

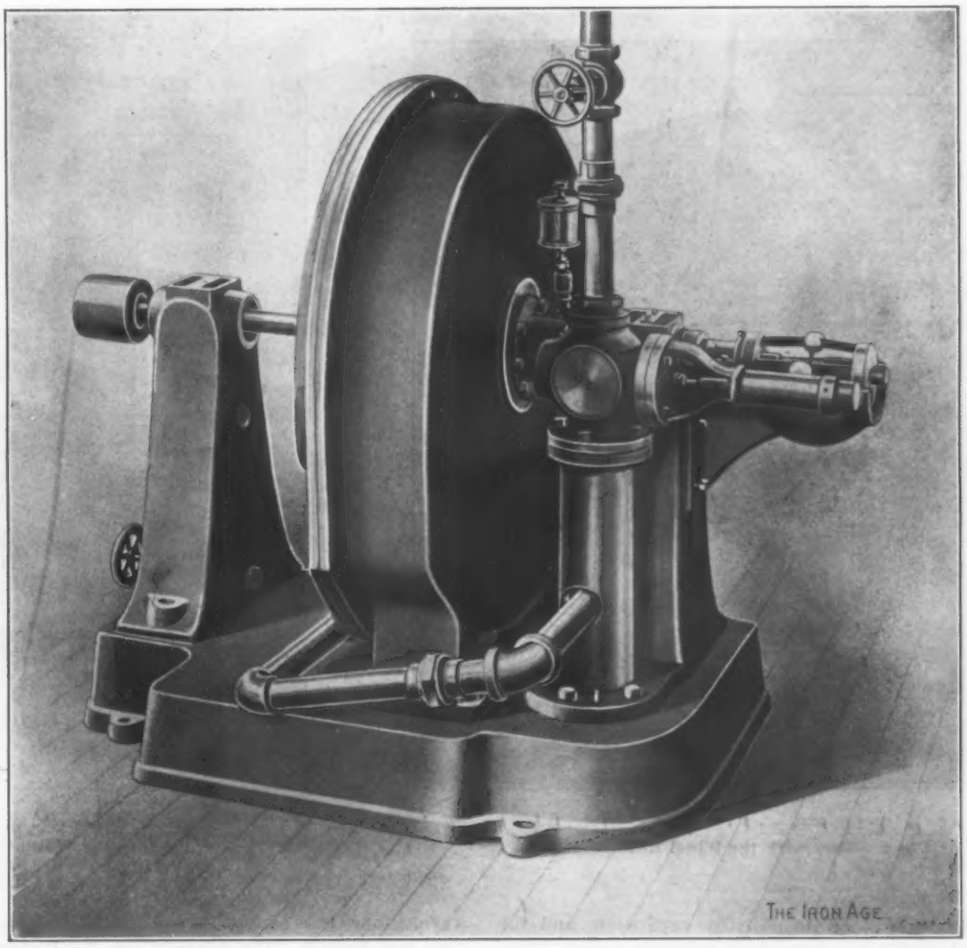


Fig. 1.—Exterior View of the Terry Steam Turbine.

The accompanying half-tones were taken from a 30 horse-power model, and, with the line drawings, illustrate quite clearly the construction. Fig. 1 is an exterior view of the complete turbine. Fig. 2 shows the case with the wheel removed. Fig. 3 is a view of the wheel. Fig. 4 shows in enlarged elevation a sectional side view of part of the wheel and the confronting reversing chambers, and an end view of the exterior of a part of the stationary reversing chambers and connected parts with a broken out portion in section. Fig. 5 is a sectional view of a part of the wheel and adjacent part of the case on the line A A of Fig. 4, with a detail sectional view of one of the steam nozzles on the line B B. Fig. 6 is an enlarged diagrammatical view illustrating the course of the steam in a wheel bucket and a confronting reversing chamber.

The wheel consists of two steel disks secured to a cast steel hub on the shaft and bolted together near their circumferences where they clamp the drop forged buckets. The reversing chambers are similarly secured betwen the stationary plates *d* and *e*. The annular steam chamber is supplied through a pipe connection in the manner shown and communicates with the several steam jets; in this case there are three of the latter, although the number may be greater where more power is required. The exhaust chamber is in the form of an expanding scroll ending in a discharge opening at its largest point. The individual steam jets *a* are regulated in the amount of their opening by means of adjustable pins, *b*, and are arranged to discharge into the wheel from one of the curved side edges of the reversing chambers.

The buckets and reversing chambers are essentially flat semicylinders, with their open sides facing one another. They are formed of plates on the broad sides, with curved side walls set at right angles to the plates. These chambers are arranged in a circular series, lapping one upon the other in the form of a series of steps—that is to say, the axes of the several buckets and chambers are set obliquely to the circumference of the wheel. Their open edges are inclined at a slight angle with the axis of the shaft, so that the steam after being reversed in each chamber is delivered to the next succeeding bucket, this being repeated as often as may be desired. The

inventor has found from his experiments that the medium between too slow a speed, and its consequent loss by steam friction, and too fast a speed, which would necessitate the use of reducing gears in transmission, requires four or five reversing chambers to each jet.

As shown in Fig. 4, the plates which form the broad sides of the buckets are curved longitudinally for the purpose of making the space between their inner ends greater than it would be if the plates were straight. In fact, by curving the plates in this manner there is so little difference in the distance between their outer and inner ends that they may be said to be practically parallel.

In Fig. 6, where the bucket and reversing chambers are shown with their openings registering, the course of the steam is indicated by the dotted lines. The steam, issuing from nozzle *a*, travels around, following the curved inner wall of the bucket, and then the curved wall of the reversing chamber; this part of the steam being arbitrarily termed primary steam. The second time around the steam gradually widens its path by expansion, and follows around inside the current of primary steam, forming what is called secondary steam. And so it continues in its course until it reaches a crescent shaped hole, *g*, in the central part of the chamber, through which it escapes. In practice the action is somewhat different, for the buckets are moving while the steam is flowing from nozzle to bucket and bucket to chamber, but it follows practically the path indicated. It does not, of course, reenter the same bucket in its secondary form.

In this manner the problem is overcome which has always proved a difficult one in steam turbine practice, because the high velocity of steam makes it impracticable to impart its energy to the rotating element at one impact, as is done in the case of the water wheel. It is well known that when a water wheel operates at its maximum efficiency the circumferential velocity of the wheel must be one-half of that of the issuing column of water. If the same scheme were attempted in a steam turbine the velocity of the wheel would be so high that it would introduce complications such as excessive friction and difficulty in reducing the speed to a practicable value for transmitting, but by passing the steam through four or five buckets before consuming its full energy, a speed of one-fourth or one-fifth is possible with the maximum efficiency.

The turbine shown has a wheel 2 feet in diameter, and, as stated before, develops 30 horse-power. The same size wheel might be used up to a capacity of 100 horse-power, for the reversing chambers are placed about but one-third of the circumference in three groups of five each. There are 70 buckets on the wheel, two-thirds of them being nonactive at any instant. Consequently, if the reversing chambers were made equal in number to the buckets and a corresponding number of steam jets were supplied, the power might be greatly increased, as indicated. By actual test the model shown developed its 30 horse-power with steam at 145 pounds pressure when operated noncondensing. Under these conditions the steam consumption was 32 pounds per brake horse-power per hour, and the wheel made 2600 revolutions per minute with a peripheral speed of 260 feet a second. When exhausting into a condenser the wheel ran at 3300 revolutions per minute, or a peripheral speed of 330 feet per second. The buckets are 2½ inches long—that is, the supporting side disks are 2½ inches apart, are 1¼ inches deep, and their edges are 1 inch apart. The reversing chambers are substantially the same size. The shaft runs in ordinary ring oiling bearings, and the speed is regulated by a Pickering governor running at the speed of the turbine.

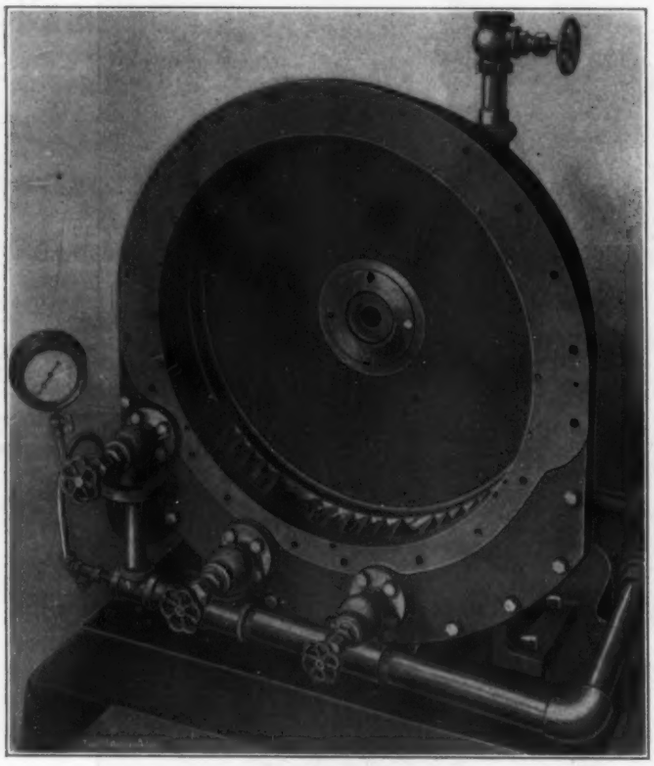


Fig. 2.—Case with the Wheel Removed.

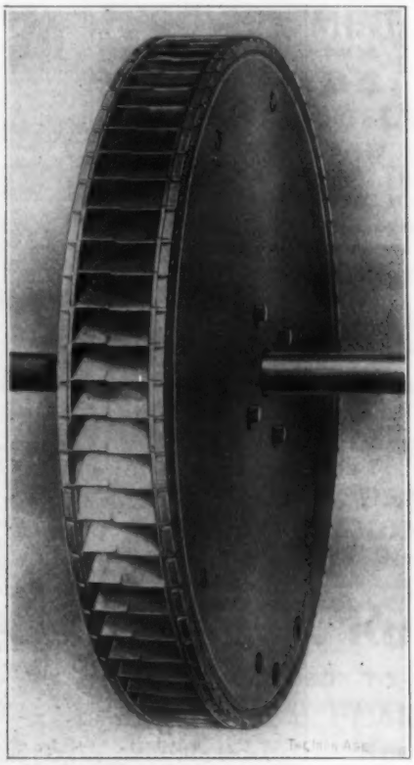


Fig. 3.—The Wheel.

There are many interesting modifications in which the turbine may be built without altering the principle of its action. For example, the buckets may be placed in the side of the wheel, instead of in its face, and the reversing chambers be correspondingly situated. In a turbine constructed with two such sets on the opposite sides of the disk, set to produce rotation in the same direction, each would counteract the end thrust produced by the other, and nearly double the power might be obtained from a machine of a given size. Should it be desired to produce a turbine capable of rotating in opposite directions, the buckets and chambers on the opposite side of the disk may be set to act in opposite directions, and being used alternately, would provide for direct or reverse rotation of the shaft.

The Newberry Charcoal Blast Furnace.

The charcoal blast furnace at Newberry, Mich., operated by the Michigan Iron Company, surpassed all its previous records on February 29. On that day 87 tons of high grade charcoal pig iron were manufactured. The furnace is 50 feet high by 10½ feet in diameter at the bosh, and is therefore comparatively small. This makes the record remarkable. The average production of furnaces of this size is from 60 to 65 tons a day.

The furnace was put in blast under the present management on March 10, 1903, after it had been remodeled

The furnace has worked splendidly ever since it was blown in. No trouble whatever was encountered; not even a slip. Since blowing in the furnace has run every day, with the exception of about one week, covering the national holidays, &c. The recent record breaking run is not expected to mark the limit of production, but the manager expects to turn out a still larger product. The furnace has made a run of a full month of 80 tons a day on a mixture of iron ore yielding 48.91 per cent. of iron. The temperature of the blast is 800 degrees F., and the pressure is 5½ pounds.

Manager E. E. Johnston was for a number of years

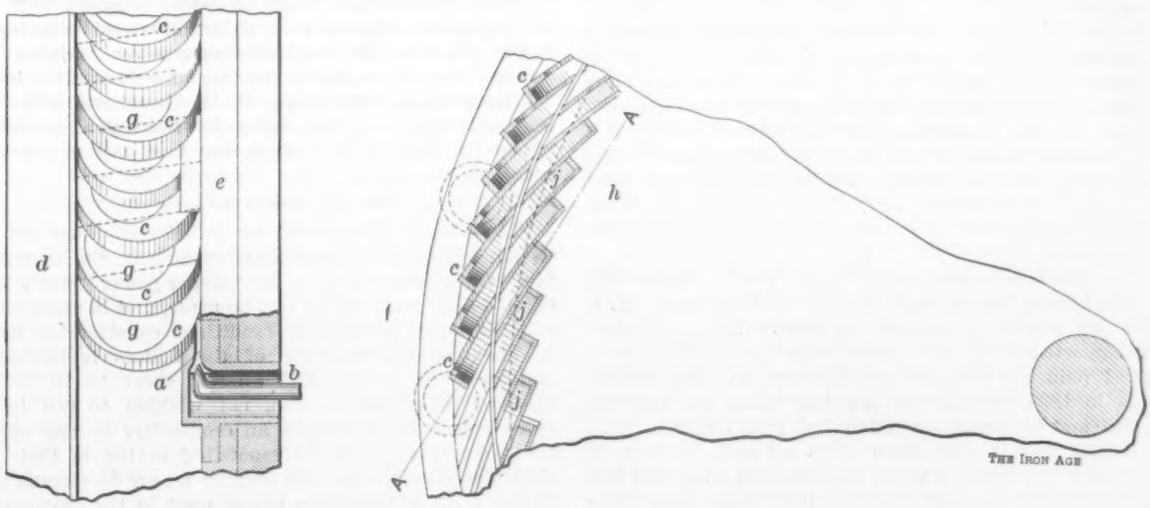


Fig. 4.—End and Side Sectional Elevations of a Portion of the Wheel and Confronting Case.

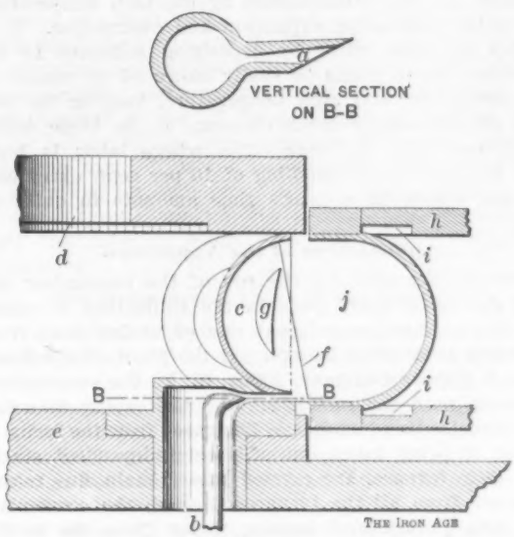


Fig. 5.—Sectional Plan View of a Bucket, Reversing Chamber and Nozzle.

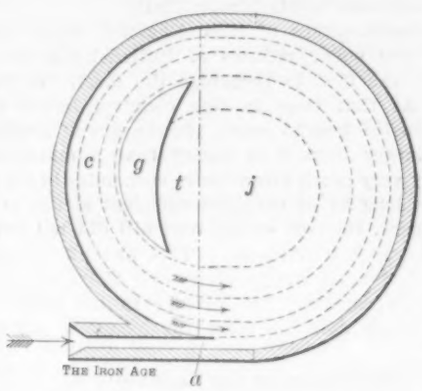


Fig. 6.—Diagram of the Course of the Steam through Bucket and Reversing Chamber.

chemist for the Ashland Iron & Steel Company, Ashland, Wis., and afterward took charge of the laboratory for the Manistique Iron Company, Manistique, Mich. The general offices of the company are at Detroit, Mich. Joseph H. Berry is chairman, W. G. Sharp vice-chairman, R. H. Jenney manager of the timber lands and stores department, W. G. Smith treasurer and John Christian secretary. The product is marketed as the Michigan brand of charcoal iron.

under the supervision of E. E. Johnston, furnace manager. It had been out of blast for some considerable time, and a great deal of work was found necessary when preparations were made for the resumption of operations. A new battery of boilers was installed, new gas mains were laid, a new hoisting plant was erected, a pump house was built and equipped with improved pumps, a battery of 40 charcoal kilns was built, new ore sheds and trestle work were constructed, and 5 miles of railway were built. The ore sheds were located more conveniently to the furnace than before, and are so constructed that no trimming of the ore is required when it is dumped from the cars. Wherever a labor saving device could be used to advantage about the furnace it was installed. All the work in question was accomplished in a period of four months, and in the worst season of the year for conducting such operations

---

The New England Iron League, the association of the manufacturers of structural iron and steel, elected the following officers at their annual meeting held recently at Boston: President, Henry M. Jones, the Megquier & Jones Company, Portland, Me.; vice-president, Joseph W. Lovett, the Smith & Lovett Company, Boston; treasurer, Frank E. White, G. W. & F. Smith Iron Company, Roxbury, Mass.; secretary, Frank A. Wilson; executive committee, D. H. Andrews, Boston Bridge Works; W. B. Douglas, Chelmsford Foundry Company, Boston; and the president, *ex-officio*.

The Green Fuel Economizer.*

BY A. H. BLACKBURN, MATTEAWAN, N. Y.

History of the Invention.

In 1845 the late Edward Green of Wakefield, England, after two years of careful experiment, took out his first patent for a fuel economizer, patent No. 10,986 in the English Patent Office, which is practically the foundation upon which all subsequent economizer improvements are more or less based. Although this patent was taken out in 1845, it was not until after the First International Exhibition, held in London in 1852, when the economizer was exhibited, that steam users in Europe seriously recognized the great opportunity for saving that was by its means placed within their reach. From that date, however, its success was assured, and the large amounts of coal that were economized by the users who gave it a trial brought it to the attention of the manufacturing community. At the present day the invention is used by owners of boilers all over the globe, and it is computed that it effects a saving of upward of $7,000,000 per annum.

The first economizer erected in the United States was in 1867 by the late Thomas Sanders of Providence, R. I. When on a trip to England he bought the economizer and imported it for his bleach and dye works. On a visit I paid his son, Thomas Sanders, at Sandersdale, R. I., in 1893, he informed me that when the machine arrived and he found his father had paid for it in gold, when gold was at a premium of 93 per cent., he thought his father had made a great mistake, but after the machine was put up and working they were more than pleased with the extra amount of steam they could make with less fuel, and subsequently when they moved their location from Providence to Sandersdale the economizer was the only piece of steam plant they moved. This economizer was in service from 1867 to 1893, when it was replaced by a new machine. The same company also bought one of the Green economizers exhibited at the Centennial Exhibition in 1876, which also has recently been replaced by a duplicate economizer. Two Green economizers were exhibited in 1876, one in actual operation and one in Machinery Hall.

The manufacturers of New England, where coal is high, and the sugar refiners of Philadelphia and New York were the first to recognize the merits of the apparatus. At that time in this country, however, and until within the last 15 years, the margin of profits was so much larger than it is to-day that a manufacturer did not pay very much attention to economies in his boiler house. As long as he obtained sufficient steam to drive his machinery, the cost of his coal bill did not cut very much figure in his dividends. This has all changed in these days of keen competition, and the manufacturer is looking as carefully for savings in his steam plant as he is in his machine tools, his looms or his rolling mills.

The Object of the Economizer.

The object of the economizer, as its name implies, is to save fuel, which it accomplishes by utilizing the heat in the waste gases leaving the boilers, before they enter the chimney, for heating feed water for boilers or hot water for manufacturing purposes. In order to use as much as possible of the heat in the gases of combustion a steam boiler is provided with more or less heating surface, and as the hot gases pass over the surface this heat is gradually abstracted from them for the reason that the surfaces of the boiler are cooler than the gases. The rate at which these gases give up their heat depends on the difference of temperature between the gases and the water.

The temperature of water in a boiler is very near the temperature of steam corresponding to its pressure, and therefore when the temperature of the gases by the absorption of the heat begins to approach the temperature of the steam the absorption becomes very slow and a large extension of heating surface only produces a slight cooling effect on the gases. At this point the first cost of adding heating surface to the boiler is not counterbalanced by increasing evaporation. In boiler practice to-day the escaping gases will average from 450 to 550 degrees F., and as it is impracticable to use this heat by extending the heating surface in the boiler, by applying an economizer and passing the cool feed water through it the lower temperature gases can be economically utilized. We have recently installed in a large cotton mill power plant economizers where the ratio of heating surface in the economizers is equal to the heating surface in the boilers. The two plants are each arranged in five units, each unit consisting of two horizontal return tubular boilers of 100 horse-power each and an economizer. Out of each unit of 200 rated boiler horse-power between 400 and 500 horse-power is being developed and the gases are leaving the economizer below 250 degrees F., thus using all the heat available. On tests recently made the plant is showing a very high efficiency, obtained at a minimum first cost of installation.

The Advantages Claimed.

The advantages claimed for a fuel economizer are, as its name signifies, 1, and most important, the saving of fuel. On a modern, up to date steam power plant a saving of 10 per cent. in fuel can be made, and in many cases under every day working conditions considerably more. 2. The steaming capacity of the boilers is increased. A manufacturer may find himself short 10 to 15 per cent. of boiler power, and, not wishing to put in an extra boiler, by putting in an economizer he can obtain the same result at a corresponding saving in fuel. In the boiler plant of our own foundry we are developing over 20 per cent. of the horse power used in the economizer. 3. A large volume of water above the boiling point is always available to take care of sudden demands for power when a heavy load comes on, thereby enabling the firemen to keep an even pressure of steam. 4. It prolongs the life of the boilers by the high temperature feed water, preventing expansion and contraction. 5. It purifies the feed water by depositing sediment in the apparatus where it can be easily blown off by reason of slow circulation and high temperature, keeping the surfaces of the boilers much cleaner. 6. In large boiler plants, especially in large cities where labor is high, labor is saved in the handling of 10 per cent. extra coal and ash, which in a year's time amounts to quite an item.

Applications of the Apparatus.

New applications for the use of the economizer are being developed every year in the utilization of waste heat apart from the original one of saving heat from the waste gases from boilers. At the plant of the Rome Brass & Copper Company, Rome, N. Y., the economizers are being used for reclaiming the heat going to waste from the reheating furnaces. The gases from the furnaces instead of being taken out of short independent stacks from each furnace, are carried into a main flue taking the gases from all the furnaces through the economizer to a single stack and heating water from 100 to 300 degress F. At the Pennsylvania Steel Works, Steelton, Pa., the gases from the blast furnaces, after passing the boilers, are carried through economizers and with the automatic scrapers in use on the tubes there has been no trouble in keeping the tubes clean. The economizer is also being used for utilizing the waste heat from rotary cement kilns.

In one of the large department stores in Philadelphia an economizer has been working successfully for some time, utilizing the waste heat from a Morse refuse destructor, and economizers have been extensively used in connection with garbage destructors in Europe. In quite a number of the oil refineries of the Standard Oil Company economizers are used for utilizing the heat from the oil stills and have proved a very profitable investment.

In bleacheries, dye works and other manufactories using large quantities of hot water the economizer is placed behind the boilers and the hot water is utilized in the manufacturing process, giving very considerable economy, where live steam had previously been used. In several of the large hospitals and laundries in the

* Read before the Philadelphia Foundrymen's Association, March 2, 1904.

United States and Canada the economizer is furnishing the hot water for washing purposes. A very economical way for heating mills and factories by the hot water system is to use the economizer for heating the water. The water is pumped through the economizer into the heating system and returned again to the economizer. In passing through the system the water will lose about 20 degrees F. The water will return to the economizer from 160 to 170 degrees and leave from 190 to 200 degrees F.

We are now installing a plant for a large electric railway and light company who do a large public heating business in the winter, for which the economizer is going to be used, and in summer, when the heating system is not in use, the economizer will be utilized for heating the feed water for the boilers.

In the making of water gas the process is an alternating one. Steam is blown through for ten minutes and gas is made; then it is necessary to shut the steam off and blow air through the generator. carburetor and superheater and into the open air, to heat them up again for ten minutes; then the air is shut off and steam turned on again and gas made for another ten minutes, and so on alternately. During the process of blowing through a great deal of heat is lost, a large portion of which can be reclaimed by putting it through an economizer. It was feared, when first installing an economizer, that gas might accumulate in the economizer and cause an explosion, but if the pilot lights at the stack valve are kept burning there is no risk at all. Thus using an economizer, heating the water for the boilers, the water is heated up to a temperature corresponding to the temperature of the steam in the boilers, usually about 350 degrees F. In addition, sufficient water can be heated to heat the water in the water seals of the gas tanks in the winter to prevent them freezing.

In paper mills there is a field for economizers for utilizing the heat from the soda ash kilns as well as from the boilers. In the smelting of ores there is quite a percentage of valuable metal carried away in the fumes passing away up the stack, and long flues have been designed to cool off the gases and deposit this metal in the bottom of the flues, where it is carefully collected and reclaimed. This can be done far more efficaciously by installing an economizer and passing a large volume of water through to cool the gases, when they will deposit the valuable metal into the chamber under the economizer.

The Commercial Value of the Apparatus.

We will now consider the commercial side. From our records we find that the average life of a well built economizer is from 15 to 20 years, with ordinary care and attention, and therefore it is a conservative basis to allow a 6 per cent. depreciation. From records of a number of large plants the cost of maintenance and repairs has not exceeded 1 per cent., but to be on the safe side allow 2 per cent.

The value of an economizer varies in proportion to the cost of fuel and the heating value of that fuel, and the cost of installation varies according to the designs and conditions of each particular plant. Taking the averaging manufacturing plant, and estimating a saving of 10 per cent. in the total fuel consumed during the year, working 300 days during the year and ten hours per day, the economizer will show the following gross return on the investment:

	Per cent.
With coal at $5.00 a net ton	48.1
With coal at 4.00 a net ton	38.5
With coal at 3.50 a net ton	33.7
With coal at 3.00 a net ton	28.9
With coal at 2.50 a net ton	24
With coal at 2.00 a net ton	19.2

Subtracting from this gross return per annum on the investment the cost of depreciation, maintenance and repairs, with coal at a cost of $2 per ton delivered in the boiler house, the economizer pays a good return on the investment. If a plant works 20 hours out of the 24, as a number of manufacturing plants do, the return doubles up. This estimate only takes into consideration the saving of fuel, to which should justly be added the gain from the other advantages mentioned in the first part of this paper.

In the above estimate I have only considered the average boiler plant, taking a conservative estimate of 10 per cent. saving, but where hot furnace and other gases are available a much larger saving is being made.

Description of the Apparatus.

The economizer consists of a series of cast iron tubes, usually about 9 feet in length and 4 9-16 inches in external diameter, arranged in sections of various widths. The sections are formed by forcing the tubes simultaneously into top and bottom headers by means of hydraulic presses. The ends of the tubes are accurately turned to gauges, and the headers are bored out and reamed to standard measurements, forming a perfect metal to metal joint when pressed together. The sections are joined together by branch pipes or manifolds running lengthwise, one at the top and one at the bottom on opposite sides, the branch pipes being outside the brick work which incloses the apparatus. Each tube is encircled by a set of triple, overlapping scrapers with bevel cutting edges, the lugs of which rest on lifting bars. These travel up and down the tubes at a slow rate of speed, the object being to keep the external surface free from soot. The soot drops down into the soot chamber between the sections, where it is periodically cleaned out. The mechanism for working the scrapers is fixed on the top of the economizer, outside the chamber, and is driven from a countershaft or small independent engine or motor. Over each tube is placed a hand hole lid for cleaning out, and on the connecting branch pipes are also lids to clean out the headers, making all the internal surfaces accessible from the outside. The hand hole lids are all accurately turned to standard gauge and the headers reamed to match, making metal to metal joints.

On a great many economizers now being erected, in place of using brick walls to inclose the chamber, a sectional sheet iron covering is used lined with 2 or more inches of magnesia and asbestos nonconducting material, which very much facilitates cleaning out and also saves considerable infiltration of air which takes place through ordinary brick work.

Economizers have to stand the same pressure as boilers, as the feed water is pumped direct through the economizer into the boilers. They are now being built for pressure up to 250 and 300 pounds per square inch.

Fire Protection Engineering at Armour Institute.—There has recently been established at Armour Institute of Technology, Chicago, as a part of the regular curriculum, a course of training in fire protection engineering, which, it is believed, will cause a more thorough and intelligent treatment of the problems of safeguarding property against damage by fire. It will furnish to municipal building departments, underwriting organizations, architects, fire insurance companies and large property owners men trained to recognize the conditions of necessary or unavoidable fire hazard and to apply all known safeguards where such conditions must exist. Chicago is the ideal place for the development of this branch of engineering, not only because its extensive and varied manufacturing interests present opportunities for detailed study of the hazards of factories, warehouses, department stores and the like, but also because it has the only research station in the world for the comprehensive experimental investigation of fire protection and fire hazards as they apply to devices and materials introduced for general use. The Underwriters' Laboratories, 67 Twenty-first street, unique in the character and extent of the work to which they are exclusively devoted, will be utilized by the institute for the practical demonstration of the principles underlying fire protection and causes of fires and for the experimental study of problems connected therewith. Armour Institute is the first technical college to undertake this work, and the plan is being indorsed by contractors, insurance companies and large property owners.

A Novel Method for the Disposal of Ashes.

An 8-ton traveling derrick, recently erected for the American Railway Traffic Company of Brooklyn, for service in connection with a system for disposing of the ashes of the city of Brooklyn, is shown in the accompanying engravings. The derrick is used to unload steel ash buckets from trolley flat cars, and to dump the ashes on a fill, which is being made at Neptune avenue, near Brighton Beach. The loaded buckets weigh approximately 8 tons, and are dumped in the manner indicated in one of the illustrations.

The derrick, as will be seen, is of extra heavy wooden construction, reinforced by heavy tie rods and gussets, and designed throughout for severe wear in continuous service. One of the largest sizes of the Lidgerwood electric hoisting engines is mounted on the rear of the derrick, the hoist being operated by a 50 horse-power General Electric railway motor. The effective radius of action is 30 feet, and the boom swings through 170 degrees. The derrick has been working day and night for several weeks, and for a large part of this time has been unloading buckets at the rate of four cars an hour, or one bucket every four minutes. The fastest work up to date has been one carload of four buckets in eight minutes, but the normal capacity is usually given as 100 tons an hour.

The derrick was designed by the New Jersey Foundry & Machine Company, 9-15 Murray street, New York City, in connection with C. R. Van Etten of the American Railway Traffic Company and R. P. Taylor of the Brooklyn Heights Railway Company.

An 8-Ton Bucket at the Instant of Dumping.

The Bituminous Coal Situation.

An impression prevails in certain quarters that there will be no stoppage at the mines pending a decision as to the wages basis from April 1. Already there are strong indications that the substantial element in the membership in all sections, even in Illinois, the stronghold of the opposition to any reduction, will line up behind President Mitchell by voting for the 5.55 per cent. reduction in wages and the two-year contract offered by the operators. There is always an element eager for a fight and for a test of strength or endurance, but it is believed that few large labor strikes are inaugurated that have not the support of the conspicuous leaders of the labor organizations involved. When, therefore, the principal officers and leaders of the United Mine Workers cover the entire ground with an unanswerable argument against a strike, setting forth all that would be risked in such a contest, we become at once convinced that all danger of a strike is passing.

It is interesting to note the changed tone of these same labor leaders, for in their address it is stated: "We are now upon the eve of a Presidential election, and these

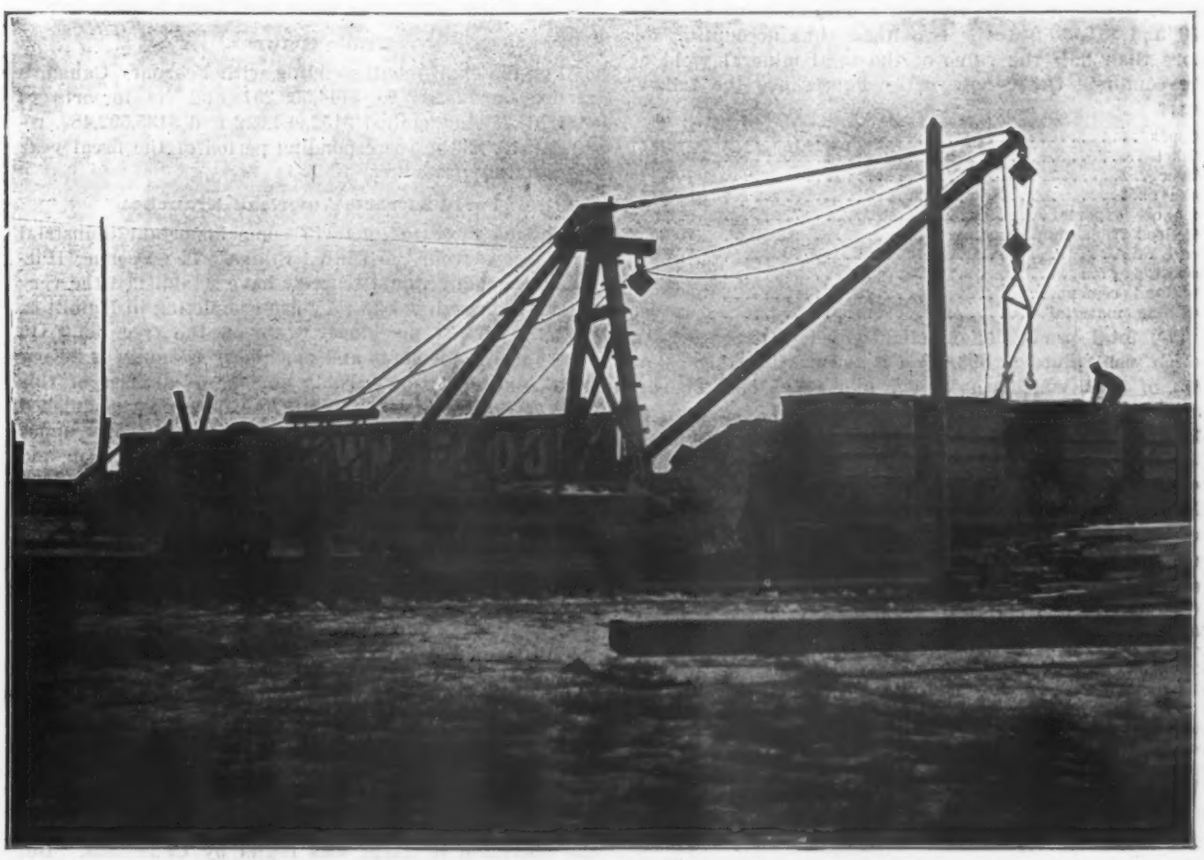
years are proverbially dull, because of the commercial disturbances which they produce." This is a radical change of policy from that pursued in 1900, when the exigencies of a political campaign appeared to persuade the miners' leaders that no better time could be selected for wresting concessions from the employers.

The president of the third largest producing concern in soft coal in this country tells the story of the outlook: "Whether there is a strike or not, I look for a good demand for soft coal from now on, because the supply is not heavy, and only about sufficient for present needs. This is due to the slow, very slow, transportation. All the railroads are in the same condition because of the bad weather. It has been the worse winter on them for a long time. With ice, snow, zero weather and floods, they have been very much hampered in the movement of traffic. Now with the ground frozen to a depth of 3 feet under the tracks a thaw will produce what railroad men technically call a "bad rail," and, of course, there will be wrecks that no one in the world can foresee or prevent. Wrecks block tracks and delay traffic." And while on the subject is may be stated that the Pennsylvania Railroad did not move a ton east from the mines for three days last week.

So far as the Pittsburgh district, the Central fields and Ohio are concerned, it is the opinion that there will be no strike. Fears are entertained, however, by several officials of the contending parties lest the Illinois and Indiana miners roll up a majority in favor of rejecting the ultimatum submitted by the operators. President Patrick Dolan of District No. 5 (Pittsburgh) says that in order to counteract the vote of the Illinois and Indiana miners the Executive Board will issue circulars to all the lodges urging the members to cast their votes in favor of accepting the new scale. He said: "We will do all in our power to avert a suspension of work. Considering industrial conditions, I think the schedule presented to us is fair and reasonable. I do not expect anything but an overwhelming majority in favor of adopting the proposition."

Probably the president of the miners' organization would not consider it germane to the subject to remind him that the industrial reaction to which he refers has been largely due to the work of himself and other leaders prominent in arrogant labor union agitation.

Central Pennsylvania producers are advancing prices each day. The price of soft coal advanced from $2.80 last week to $3.30 for Clearfield coal, at tidewater. The cars unloaded here are not sent back to the mines, because of the congested condition of traffic, and many cars have been dispatched to the anthracite region. This is done to get as much as possible of that coal here, and the price of hard coal will not be reduced until conditions in the soft coal region are changed. It is stated that the contract prices for the Clearfield coal will be $1.35 at the mines, for the contract season, if the new basis of wages is fixed. This, by the way, gives the men 60 per cent. more than they were receiving in 1897.



The Derrick About to Lift a Bucket from a Car.

A NOVEL METHOD FOR THE DISPOSAL OF ASHES.

The Corporation Profit Sharing.—The United States Steel Corporation have just completed their distribution of preferred stock to heads of departments and other important employees under the provisions of the profit sharing agreement made a year ago. This part of the offer did not affect the employees as a whole, but the more important men. Under it a certain amount of money, a percentage of the net profits, was set aside to be distributed among these beneficiaries, provided that the net profits reached $80,000,000. The percentage increases in a sliding scale with the net profits. The division of this premium to employees is one-half in cash, one-quarter in stock to be held in the treasury for five years, the employee to receive the income therefrom and to become the full owner if he remains in the employ of the company until the expiration of the five years. The other quarter

is in stock to be distributed annually, and this distribution has just been made. The recipients received with their stock a certificate which covers their claim to the other one-quarter in stock which has the five years proviso. It is not given out what amount of stock was thus distributed. It was bought in the open market at prevailing prices.

Mineral Production in Canada.

Summary of the Dominion Geological Survey.

TORONTO, March 12, 1904.—In the calendar year 1903 Canada's mineral production amounted to $63,226,510. This is the calculation of the Geological Survey, whose summary report for the year has been given out. Of the total, $33,707,403 is credited to metallic products, the remainder coming under the head of nonmetallic minerals. Gold is the largest item in the former list and coal in the latter, the value of the respective outputs being $18,834,490 and $15,957,946, the two items thus accounting for more than half the value of the total mineral yield of the country. Other noteworthy figures are the following:

Copper	$5,728,261
Nickel	5,002,204
Silver	1,700,779
Coke	1,663,725
Iron ore exports	922,571
Pig iron from Canadian ore	707,838
Lead	762,660
Asbestos	891,033
Portland cement	1,090,842
Building material	5,650,000

The total production is slightly below that of 1902, which was valued at $63,885,999, and considerably below that of 1901, which was valued at $66,339,158. The decrease in the production of pig iron is 16.77 per cent. of the quantity made in 1902. Of pig iron produced from Canadian ore solely there was a shrinkage of 41.32 per cent. With regard to pig iron and some other products, this is to be said—that the falling off in quantity was compensated for in some measure by the higher market price realized. The following remarks are made in the report concerning iron:

Exports of iron ore were 868,233 tons, valued at $922,521. About 81,035 tons of iron ore from Canadian mines were charged to blast furnaces in Canada and valued at the furnace at about $247,229. In addition to the above Canadian ore, 485,911 tons of imported ore, valued at $823,147, were used in Canadian furnaces. The total quantity of pig iron manufactured from both Canadian and imported ores was 297,885 tons, of which 19,614 tons were made with charcoal as fuel and 278,271 tons with coke.

Among exports during the calendar year, 1903, were the following:

Coal	$5,219,860	Plumbago, crude	$26,230
Copper, fine, in ore, &c.	3,702,368	Pyrites	59,604
Copper, black or coarse, cement copper and copper in pigs	25,226	Coke	135,957
Lead in ore, &c.	426,466	Grindstones, manufactured	10,734
Nickel in ore, matte, &c.	1,116,099	Stoves	11,718
Platinum in ore, concentrates, &c.	304	Castings	138,352
Silver in ore, &c.	1,989,474	Pig iron	78,382
Mica	196,020	Machinery, N.E.S.	416,397
Antimony ore	4,332	Scrap iron or steel	88,839
Iron ore	922,571	Hardware, N.E.S.	88,285
Manganese ore	1,889	Steel and manufactures of	2,078,328
		Lime	131,412
		Metals, N.O.P.	554,900
		Plumbago, manufactures of	17,412

Production at Sydney, N. S.

An interest in the affairs of the Dominion Iron & Steel Company has lately been shown by the Sydney Board of Trade. At the last meeting of that body it was unanimously decided that the time had come when some information was due from the company to the city. Business has suffered, it appears, in consequence of the state of unsettlement of the last few months. A committee was sent to see the managing directors, who informed it that the work in connection with the coal washing plant is proceeding satisfactorily and that the plant will be in operation in July. Two of the blast furnaces are producing pig iron in satisfactory quality and quantity. It is not intended to increase their number until the washing plant is complete and coke available. Four open hearth furnaces are running, and others will be started as soon as the demand for steel increases. The finishing of the rod and billet mills has been delayed because of the nonarrival of certain machinery, but it is expected that the rod mill will be in operation next month and the billet mill a few weeks later. The plans for the rail mill are about completed, and it is expected that the board will approve of them at the next meeting.

It appears that a quantity of Sydney steel has been sent to England to test its fitness for the manufacture of rails. The experiment is to be carried out under the supervision of the Dominion Government inspector, who will see that the rails produced from the steel are placed at different points on the Intercolonial Lines and tried by actual service. There is to be a meeting of the company's directors at Montreal in a few days. Graham Fraser, who has been examining steel plants in the United States, may have some new ideas to introduce.

Trade Returns.

For the eight months ending with February Canada's exports amounted to $144,599,291 and its imports to $154,761,238, as against $152,084,622 and $135,592,489, respectively, in the corresponding period of the fiscal year immediately preceding.

Tariff Attracts American Branches.

Canada owes to its tariff some important industrial acquisitions from the United States. The Deering Harvester Company would scarcely have established the very extensive branch works they are completing in Hamilton, Ont., if harvest machinery were on the free list. On most farm implements and machinery the duty is 20 per cent., and on a considerable number of articles of this class it is still higher. While the duty on the finished articles was left at the same rates as were in force under the Conservative Government, the duty on pig iron and steel was reduced. To these conditions are to be added the facts that the production of both pig iron and steel has increased in Canada in late years, and that Canadian buyers are usually able to get advantageous price terms on American iron and steel. Further, on all imported material sent out of the country in the form of finished product the Canadian manufacturer is entitled to a refund of 99 per cent. of the duty paid.

The last gain which may be credited to the tariff is that of the American Locomotive Company's enterprise. That company have purchased the plant of the Locomotive & Machine Works Company of Montreal, which works are situated at Longue Pointe, near Montreal. It cannot be said that the country has acquired them from the United States, for the works were erected and the operation of them was begun by Canadians. But the transfer of them to the American Locomotive Company means the substitution of Canadian for a considerable proportion of American production—that is, the American Locomotive Company will make at their Canadian plant much of what they would otherwise have supplied to this market from their United States shops. British locomotive builders have lately been able to give more attention to the needs of this market than they were 12 months ago, and possibly the advantage of the tariff preference in their favor, amounting to from $1000 to $2000 per locomotive, may have influenced the American Locomotive Company to make the present purchase. There should be good business for the locomotive manufacturers for some time, as this winter has shown the inadequacy of the motor power of the Grand Trunk, as last autumn's grain movement showed the insufficiency of the Canadian Pacific's. The Canadian Northern has not yet all it needs, the Tenniskaming & Northern Ontario has yet to be equipped, and the Grand Trunk Pacific, whose construction is certain to be pushed along rapidly, will have large orders in a few years.

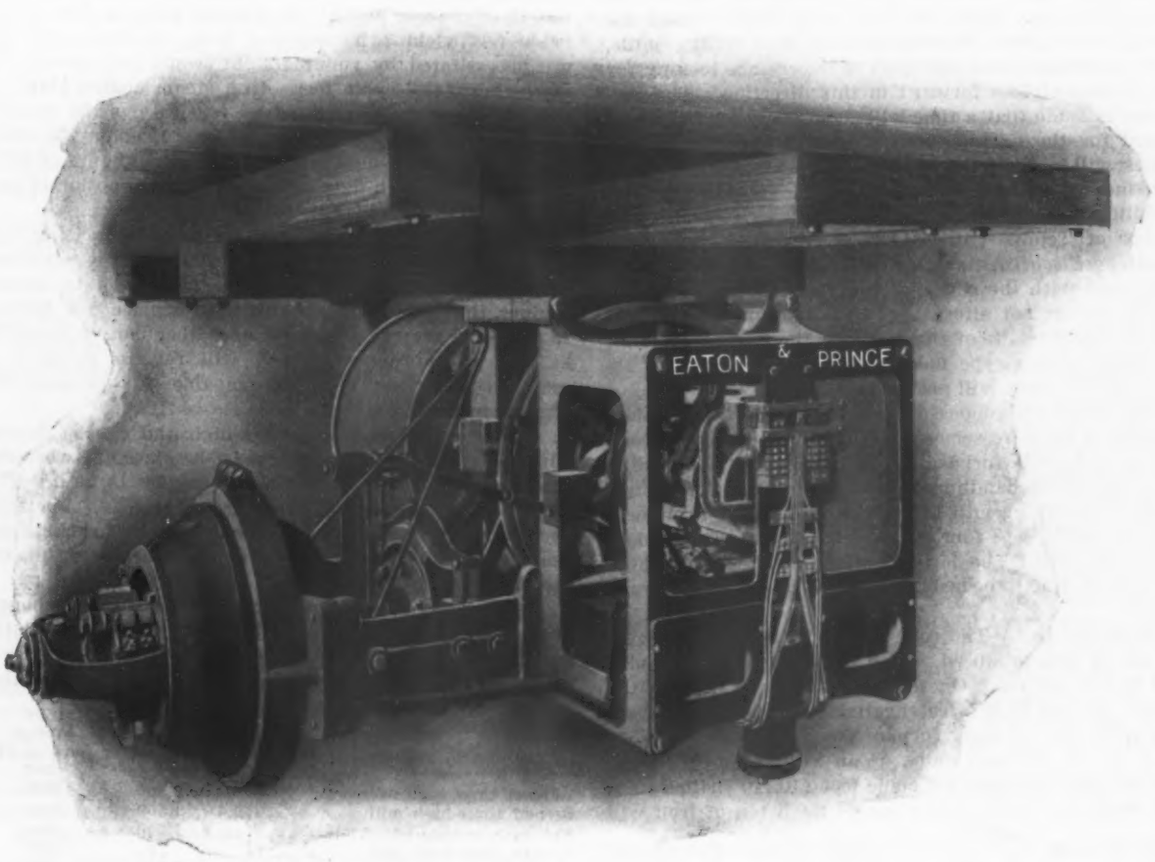
C. A. C. J.

Henry James, for many years connected with the Pencoyd Iron Works, and also the American Bridge Company, is now with the Philadelphia Roll & Machine Company as their roll designer and head of the roll department.

A New Type of Elevator Machinery.

One of the most difficult problems which confront architects, contractors or owners in the construction of a building is the proper distribution of floor space. This is especially true in a structure built for manufacturing purposes, where every inch must be considered. The model factory of to-day is equipped with such machinery that no space is wasted, and to this end the use of electricity for power has contributed in no small measure. After some 30 years' experience in the manufacture of elevator machinery, the Eaton & Prince Company of Chicago have perfected a new type of direct connected electric elevator machine, shown in the illustration accompanying this article, which is arranged to be suspended from the ceiling of the building adjoining the hatchway.

The advantages to be gained by such an arrangement



ELECTRIC ELEVATOR DESIGNED TO BE SUSPENDED FROM THE CEILING.

are many, but of chief importance is the fact that no valuable floor space is taken up, and that the cost, so it is said, is exceptionally low, both for installation and maintenance. The inclosed gear wheel and worm, accurately fitted, in connection with the reversible motor, supported and insulated separately from the frame of the winding machine in a ring and coupled direct to the worm shaft, are the principal features. This construction permits the quick removal of the motor at any time without disturbing the balance of the apparatus, or introducing any liability of injuring the insulation of the armature, or disturbing the alignment of the motor with the worm shaft. For the purpose of reducing the starting current the motor is of the compound wound type. Variable speed is obtained through a controller which is attached rigidly to the main frame and is practically a part of the winding machine. Neither chain nor cable connections are required, as the contact plates on the reversing switch are held in an automatic yoke, manipulated directly from the controller sheave. It is claimed that this controller is positive in its action, and by virtue of its construction avoids the old danger of burning contacts.

The Chicago Citizens' Alliance.

A Citizens' Alliance was formed by a meeting of business men and manufacturers at the Briggs Hotel, Chicago, March 5, based on the same code of laws and principles as govern other citizens' alliances. James W. Nye was elected president; Louis A. Heile, secretary, and T. M. Jackson, cashier of the Chicago National Bank, treasurer. It is the purpose of the organizers of this alliance to make an active canvass for members, and it is confidently expected that from 10,000 to 25,000 members will be enrolled before the end of six months. The alliance will not confine itself by any means to labor affairs, but will make it its duty to boom Chicago and to do everything in its power to overcome whatever obstacles appear to the growth of the city. Among other principles outlined are that union labels or any other emblems indicating discrimination against nonunion labor will be discountenanced; that strikes, boycotts and lockouts will be prevented wherever possible. Agents will be sent to the scene of all labor disturbances and strikes to watch for law breakers and to secure their arrest, and the association will prosecute such cases to the utmost.

The exactions of organized labor in Chicago and the loss of business resulting therefrom have reached a point where the leading business interests are thoroughly stirred up, and are ready to co-operate with any move that will set matters to rights. The latest move is to include in the membership of the Illinois Manufacturers' Association and the Citizens' Alliance the leading bankers and financial interests, in order that contractors who have in the past been forced to accede to unjust demands on the part of the unions, because of the forfeit clauses in their contracts, may have sufficient assistance of such banks as to make them independent of the labor unions. It is also proposed that tenants who are prevented from moving May 1 from present places of residence to new structures because of delay in building of such structures, by the newly organized painters' strike or for any

other labor causes, will not be compelled to pay forfeits or penalties or be subjected to hardships by the owners of the building because of their refusal to vacate.

Conditions in Chicago are ripe for a great revival of building operations, both in the way of new office structures in the downtown district and manufacturing buildings and plants in other districts. Activity in the building of flats and residences is also noted on every hand. The population of Chicago has increased rapidly, and building operations in the last three or four years, since the unions have been dominant, have not nearly kept pace with the demand for space.

The Blast Furnace as the Sole Source of Power in a Modern Steel Works.

As readers of *The Iron Age* are aware, the utilization of blast furnace gas for the generation of power in gas engines has made, in recent years, great progress in Continental Europe. This source of power is now used for electric generators, blowing engines and rolling mills, while progressive and practical engineers are looking for still greater strides forward in this direction. The prediction is made that a time will come when all the power needed for the manufacture of even the smaller rolled shapes will be derived from the furnaces in which the ore is reduced. An interesting attempt to prove the practicability of this method of working, written by Carl Gruber of Teplitz (Austria), has recently appeared in *Stahl und Eisen*. Although most of our readers will probably agree with the editor of that journal, who remarks that he "does not altogether share the optimism of the writer," and in spite of the fact that the imaginary plant described is of a type unknown in this country, an abstract of the essay will probably be of interest.

The works are supposed to consist of four 300-ton blast furnaces, a basic Bessemer plant of four 18-ton converters, two open hearth furnaces of 25 tons each, a blooming mill capable of handling the entire output of the steel works, a reversing mill for the larger sizes of structural material, rails, &c.; four three-high mills of various sizes and a rod mill. The latter and the smallest three-high never work simultaneously, one or the other being always idle.

Available Gas.—The coke consumption is put at 20 cwt. per ton of iron produced, which would give 158,915 cubic feet of gas per ton. One half of the gas is used in the stoves, leaving 79,457 feet available for other purposes. One cubic foot of blast furnace gas yields from 78.65 to 123.6 British thermal units, or an average of 101.13, so that we may calculate 106 cubic feet (10,720 British thermal units) per horse-power hour. Each ton of iron will yield, therefore, $\frac{79457}{24 \times 106} = 31.2$ horse-power. For operating blast furnace machinery (blowing engines, pumps, electric skip hoists, &c.), 7.5 horse-power will be required, leaving 23.7 available for other purposes. With a daily production of 1200 tons this will give us 28,400 horse-power, or $28{,}400 \times 106 \times 24$, approximately 72,250,000 cubic feet of gas in 24 hours. A coke consumption of 22 cwt. would yield 176,572 cubic feet of gas per ton, which would make 33,000 horse-power available for the steel works.

Power Needed in the Mill.

I. Electric Power-House.—For the plant suggested primary motor units of 500 horse-power would be advisable, of which five would be needed, four in constant use and one in reserve. The maximum would be 2000 horse-power, and the average may be taken as 1000. The requirements of the blast furnaces would be 250 horse-power, leaving 750 for the steel works.

II. Bessemer Blowing Engines.—The principal requirements for blowing engines are, first, reliability; second, prompt attainment of full power after starting; third, ability to work against varying blast pressures. Hitherto the steam engine has been regarded as the only available means of complying with these conditions. There is no doubt that an electrically driven blower could be built to fulfill all requirements, but the installation would be very expensive. A gas engine would be cheaper, but to adapt it to this purpose is a work of no small difficulty.

The first condition, "reliability," would be fulfilled by having a spare engine, which would be equally necessary if steam engines were used. The third condition, ability to work against varying pressures, would be provided for by using a sensitive valve mechanism, operated by hand. Large gas engines have already been built capable of working at 50 per cent. of their full load. The second condition, prompt attainment of full power, is the most difficult to fulfill. It would be necessary to run the engine slowly between the heats, either lettting the blast escape, or, by means of a coupling, detaching the blowing tubs from the engine. The loss of power entailed by running the engine light does not amount to a great deal. In order to convert the 1200 tons of iron made daily by the blast furnaces in 18-ton vessels 67 heats must be blown. An average of 18 minutes for each gives 20 hours' working time daily, or four hours running light. The engine without load would not, at the most, use more than one-fourth of the gas needed when under load, so that if 106 cubic feet yield 1 horse-power hour, the increased figure necessitated by running light would not amount to more than 111.3 cubic feet. In a steam engine plant in which the boilers are heated by furnace gas the volume of the latter used per horse-power hour is about 250 cubic feet. The engine should be built for a maximum of 3000 horse-power, and in figuring the daily consumption of gas an average of 1500 may be taken.

III. Rolling Department.—Of the mills comprising this department, a list of which is given above, the blooming mill and the large reversing mill are driven by steam engines, the boilers being heated with furnace gas. Owing to the rapid reverse necessary, any other motive power is at present impracticable and will remain so until a practical reversing coupling capable of transmitting larger powers is invented.

All the other mills are three-high and can be driven with gas engines. A coupling must be placed between fly wheel and the mill and enable the engines to be brought up to their speed before throwing on the load. For this purpose the German author recommends a "spring-friction" coupling constructed by a firm in Dortmund, but he does not describe it.

The product of the three-high mills consists of shapes and merchant bar (beams, channels, mine rails, flats, rounds and squares), the particular mill on which a section is rolled depending on its weight. The sizes of the gas engines used are shown below:

Mill.	Maximum horse-power of engine.	Average horse-power used.
Largest three-high mill	2,500	1,250
Second three-high mill	1,500	750
Third three-high mill	1,000	500
Fourth three-high mill	750	375
Rod mill	1,000	500

As the fourth three-high mill is only intended to run when the rod mill is standing idle, it may be ignored in calculating the power required. The reversing mill, for the heaviest sections of channels, beams and rails, is intended to have a daily capacity of 600 tons, and the average power used is calculated at 1750 horse-power. The blooming mill has to take care of the steel works output, consisting of 1150 tons from the Bessemer and 150 tons from the open hearth. Of this product 100 tons are sold as billets, and the remaining 1150 tons put into finished material. The average power of the engine may be put at 2750 horse-power.

For driving the two reversing engines superheated steam at 572 degrees F. and 150 pounds pressure should be used, as by this means a fairly high efficiency can be attained without the use of expensive compound engines. Condensation should be used, which at the present day presents no difficulties, even when connected to a central condensing system.

The amount of gas necessary to provide steam for the reversing engines must now be determined. It is usual to calculate at least 350 cubic feet of gas (101.13 British thermal units) as needed per horse-power hour. The German author thinks that, with a modern boiler plant producing steam superheated to 572 degrees F. and using

an economizer, this can be much improved upon, and that an efficiency of 80 per cent. can be attained; in other words, that 80 per cent. of the heat expended can be put into steam. He contends that even this could be beaten by the use of forced draft, in which case the products of combustion pass away with their temperature reduced to 212 degrees or even 176 degrees F., the balance of the heat being saved for the feed water by the economizer.

For calculating the amount of gas needed per horse-power hour the following premises are laid down: Superheating the steam to 572 degrees F.; steam pressure, 150 pounds; condensation; the use of an economizer to heat the feed water; average consumption of steam per horse-power hour, 15.43; efficiency of the boiler plant, 80 per cent.; yield of 1 cubic foot of gas, 101.13 British thermal units; temperature of saturated steam at 150 pounds, 361 degrees F.; total heat of 1 pound dry steam at 150 pounds, = 1192 British thermal units.

To superheat 1 pound dry steam 1 degree Fahrenheit 0.4787 British thermal units are necessary; it will therefore require (572—361 = 211) $211 \times 0.4787 = 101$ British thermal units to superheat up to 572 degrees F. The total amount of heat necessary to raise 1 pound of steam at 150 pounds pressure and 572 degrees F. from feed water at 50 degrees F. is therefore $1192 \times 101 - 18 = 1275$ British thermal units. The heat necessary for one horse-power hour is therefore $1275 \times 15.43 = 19{,}673$ British thermal units, or, allowing for 80 per cent. efficiency of the boiler plant, 24,591 British thermal units. This will require $\frac{24{,}591}{101.13} = 243.1$, or approximately 250 cubic feet of blast furnace gas.

Fuel Consumed in the Gas Engines.—The power required by the various engines is as under:

	Average horse-power.
Power house	750
Bessemer blowing engine	1,500
First three-high mill	1,250
Second three-high mill	750
Third three-high mill	500
Rod mill	500
Total	5,250

Taking 106 cubic feet as the amount of gas required per horse-power hour, it will need $160 \times 24 \times 5250 = 13{,}356{,}000$ cubic feet of gas every 24 hours.

The two reversing mills average 4500 horse-power, and, as calculated above, each horse-power hour requires 250 cubic feet of gas, so that these mills will take daily $250 \times 24 \times 4500 = 27{,}000{,}000$ cubic feet. This, added to the 13,356,000 cubic feet used in the gas engines, absorbs 40,356,000 of the total 72,250,000 cubic feet, leaving 31,894,000 cubic feet still available.

Owing to the great fluctuations during the day in the amount of power used, it would be necessary to arrange a large gas holder, or preferably several small ones, between the blast furnaces and the points of consumption. This would have the advantage that the quality of the gas would be made more uniform as well as the supply.

Reheating Furnaces.—The analysis of the gas is supposed to be 8.5 per cent. CO_2, 0.71 per cent. O, 25.41 per cent. CO, 4.31 per cent. H, 0.3 per cent. C_2H_4 and 60.77 per cent. N, which corresponds very closely to an analysis made at Differdingen, and which would have a calorific power of 104 B. T. U. The pyrometric effect of this gas would be 2760 degrees F, which figure takes into consideration the greatly increased specific heat of steam and carbonic acid at the temperature of combustion, as compared with ordinary temperatures. This pyrometric effect is that which is obtained when the gas and air are burned at the ordinary temperature, but in regenerative furnaces both are heated. Figuring that the gas is preheated to 1562 degrees F., the air to 1742 degrees F., and that an excess of air amounting to 20 per cent. is needed, the temperature in the furnace would be 3902 degrees F., which would be amply sufficient. By placing steel works and rolling department near together, so that the ingots reach the soaking pits while still hot, the necessity of firing the latter will be avoided, and if the engines are sufficiently powerful, the larger sizes of beams and channels can be finished without reheating. Even if reheating should prove unavoidable, a very small amount of fuel will suffice, as the blooms will leave the blooming mill at a good temperature. The equivalent of 3 per cent. of good coal—*i. e.*, 67 pounds per ton of steel rolled—should be ample to do the work. This will require 6886 cubic feet of furnace gas, equivalent with a daily (24 hours) output of the reversing mill of 600 tons, to a consumption of 4,132,000 cubic feet. The above output of the reversing mill, added to the 100 tons blooms sold as such, leaves a balance of 550 tons to be taken care of by the other mills. The reheating of this material will take a greater percentage of fuel than that required in the large reversing mill. The equivalent of 6 per cent. of coal may be reckoned on, which would give us $13{,}772 \times 550 = 7{,}574{,}600$ cubic feet daily. Supposing that for these 550 tons it would be necessary to heat the soaking pits with the equivalent of 3 per cent. of coal, a further amount of gas would be consumed amounting to $6886 \times 550 = 3{,}787{,}300$ cubic feet. The total gas required, therefore, for soaking pits and reheating furnaces would be $4{,}132{,}000 + 7{,}574{,}600 + 3{,}787{,}300 = 15{,}493{,}900$ cubic feet.

Open Hearth Plant.—The two furnaces are supposed to take care of the Sunday pig iron and the scrap made in the various mills, producing about 150 tons every 24 hours. The pyrometric effect of the gas, 3902 degrees F., is amply sufficient for open hearth purposes. Figuring that an amount of gas will be needed equivalent to a total consumption of 26 per cent. of the weight of ingots produced, we get 9,000,000 cubic feet as the amount of gas required in this department.

Total Amount of Gas Used.—This will, therefore, be as follows:

	Cubic feet.
Gas engines	13,356,000
Boilers	27,000,000
Reheating furnaces	15,494,000
Open hearth	9,000,000
Total	64,850,000

Deducting this total from the 72,250,000 cubic feet available at the blast furnaces, there is a balance of 7.4 million cubic feet, equivalent to nearly 3000 horse-power.

Coke Plant.—Should the works make their own coke at a by-product plant situated near the mills, a still more favorable result would be obtained. To make the 1200 tons of coke required daily 1580 tons of coal would be needed, which would yield 15,623,000 cubic feet of gas. Of this 60 per cent. would be required for heating the ovens, leaving the balance 6,250,000 cubic feet for other purposes. One cubic foot of this gas yields about 500 B. T. U., and in a gas engine about 24.7 cubic feet of it are needed per horse-power hour, so that about 10,500 horse-power could be generated. Of this the coke plant would probably need 10 per cent., leaving 9500 horse-power available in the mill. It would be better to use this gas in the open hearth plant, as it could be used without preheating, as is the practice with natural gas. About 21 cubic feet would be equivalent to 1 pound of coal, so that a plant making 150 tons a day with the equivalent of 26 per cent. of coal would need 1.8 million cubic feet, less than one-third of the amount made.

The German author proposes to largely augment the power available by using the heat of the exhaust, and also the cooling water, from the gas engines to generate power. This he proposes to do by using cold steam engines—that is to say, engines using the vapor of some such fluid as sulphur dioxide or liquid carbonic acid instead of steam. He claims that such engines have already got beyond the experimental stage, but in this country at least any idea of their use for the purpose indicated must be considered at least premature.

The Board of Directors of the Pennsylvania Railroad, at their meeting in Philadelphia last week, authorized the building of 146 locomotives and 106 coaches in the shops of the company at Altoona, Pa. Of the locomotives 83 will be for passenger service and the rest for freight.

The bimonthly settlement of the wage scale of puddlers and finishers was arranged in Youngstown, Ohio, last week. The rate of $5.25 a ton for puddling in force during January and February will also continue in March and April. There was no change in the finishing scale.

A Large Portable Pipe Cutting Machine.

The machine shown in the accompanying engravings, said to be the largest portable pipe cutting machine in the world, was designed and constructed for use on the Lardner's Point pipe distributing system for the water supply of the city of Philadelphia. The machine was required by the contractor in order to fill the conditions imposed by a clause in the contract specifications which reads as follows:

"No. 115, Cutting Pipe.—Whenever a length of pipe requires cutting to fit in the line it shall be done with a machine which will leave a smooth end at right angles to the axis of the bore. (No cutting with chisel and hammer will be allowed.) This work must be done by the contractor, to the approval of the engineer, and to be included in the price bid per ton for pipe and special castings, furnished, delivered and laid."

Fig. 1.—Manner of Removing the Machine at the End of a Cut.

Harmer & Quinn of Philadelphia, contractors for the laying of the mains, were unable to find in the market a machine which would fulfill these conditions, as all failed either in strength or cutting qualities. Under the direction of John W. Hill, chief engineer of the Bureau of Filtration, Department of Public Works of the city of Philadelphia, P. Hollingsworth Morris, of the same city, undertook the construction of a machine which would meet the requirements. The pipe to be cut was 60 inches in diameter and 1 7-10 inches thick, weighing on an average 13,650 pounds per length, or 113.75 pounds per foot.

The frame of the machine is well shown in Fig. 1, which shows it in the operation of being removed after a cut has been completed. Fig. 2 shows the machine in position for use, with a segment of cut pipe alongside, so that one may readily distinguish just how much of the right hand figure is the machine itself. The frame of the machine is formed of two flanged steel heads, having the center cut out, leaving rings of suitable diameter. These are united by braces, and between them are four jaws joined by bell cranks and rods to form a readily adjustable gripping chuck. The cutting tools are attached to a two-part ring, the outer circumference of which is provided with gear teeth. This ring is guided in a second ring bolted to the outside face of one of the heads forming the main frame, and is revolved by a small pinion driven through a train of gearing from the pulley shown at the top. As shown in Fig. 1, the machine is constructed so as to part on the horizontal center line. To allow of this it is necessary that the tool supporting ring be in the proper position—*i. e.*, with the tools at their highest and lowest positions respectively.

In a shop trial the time occupied in cutting off a pipe of the dimensions previously given, exclusive of the time spent in adjusting the machine on the pipe, was one hour. Since that time, in practical use in the trench, the time of actual cutting has been reduced to 48 minutes, and thus far there has been no break or failure of any part in the machine.

Among the advantages claimed for the machine the first and most important is that the pipe will be cut accurately at right angles to its axis, leaving a smooth surface at the end instead of the more or less jagged edge which results when the cut is made with a chisel and which often impairs the joint with the adjoining pipe. Other advantages are the economy of time in making a cut (only about one-quarter of the time of hand cutting) and the economy of pipe. Pipe such as is used in the Lardner's Point pipe distribution system is worth about $18.67 per linear foot. Therefore it is very desirable to make the waste as small as possible. Again, in cutting pipe with a hammer and chisel there is a liability of cracking either or both pieces of the pipe in the attempt to separate them, whereas with this pipe cutter no such danger is present. Still another advantage lies in the ability to make a closure in a large pipe line with barely enough room between the two pieces to put it in place and allow the usual play for expansion. With 60-inch pipe it would scarcely be possible with a hammer and chisel to make a closure with a margin of less than 1½ inches, while with this machine a ½-inch margin is sufficient. For example: If a closure exactly 6 feet long was required, the pipe to be inserted by the old method could not be cut longer than 5 feet 10½ inches, but with a smooth cut made at exact right angles with the axis the pipe for a 6-foot closure could be made 5 feet 11½ inches long, leaving ¼-inch play at each end.

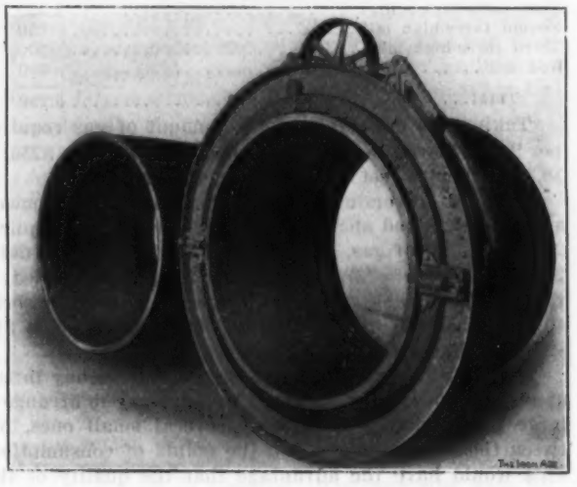


Fig. 2.—Machine in Position for Cutting, and a Specimen of its Work.

Officials of the Pressed Steel Car Company, Pittsburgh, state that they will appeal from the recent decision of the United States District Courts in the patent infringement case of John N. Hansen, president of the Standard Steel Car Company. The decision rendered was against the former company. The questions involved in the case are entirely new, and a decision on the appeal will be awaited with much interest.

Invitations are out for the sixth annual convention of the National Metal Trades Association, to be held at the Hotel Walton, Philadelphia, March 23 and 24. They are handsomely engraved and are accompanied by a card of identification, to be properly filled out and presented to the Committee on Credentials at the convention.

An Inside Riveting Device.

The contrivance illustrated in the accompanying engravings is one of many special riveting devices manufactured by the Philadelphia Pneumatic Tool Company, Philadelphia, Pa. It is designed for riveting pipe of large diameter, the riveting being done on the inside. This permits the hot rivets to be put through the holes from the outside of the pipe, and allows the dolly bar or block hammer, with which the head is held in place, to be handled with the greatest facility. The half-tone, Fig. 1, shows the complete apparatus and the line drawing, Fig. 2, shows in detail the method of suspending the hammer by springs. An ordinary riveting hammer is employed, being supported as shown on the central pivot of the pipe frame work. The hammer can thus be swung around the inside circumference of the pipe, bringing it into any desired position, and as the work progresses the whole device may be moved ahead within the pipe. In this case the riveting hammer shown is the regular No. 9, as made by the Philadelphia Pneumatic Tool Company, being one especially adapted to this class of work by virtue of its claims for light weight, great power and economical use of air. This machine was built for shipment to British Columbia, near Vancouver, where it will be employed in riveting a large water main.

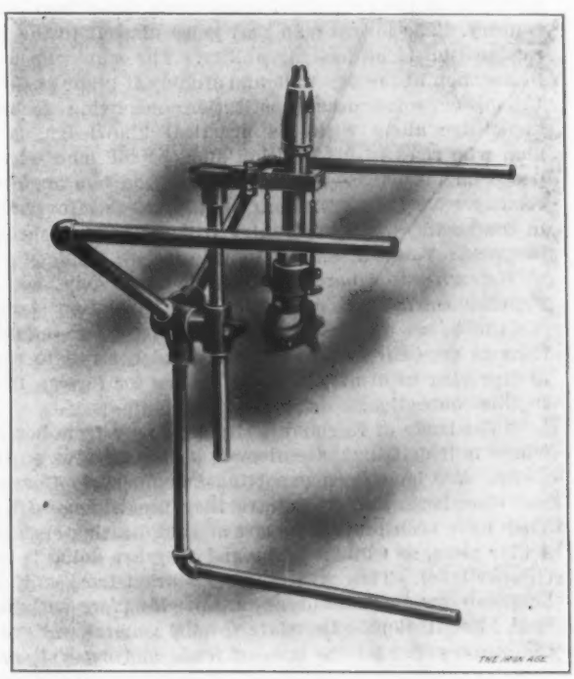


Fig. 1.—Complete Device, Showing Supporting Tripod.

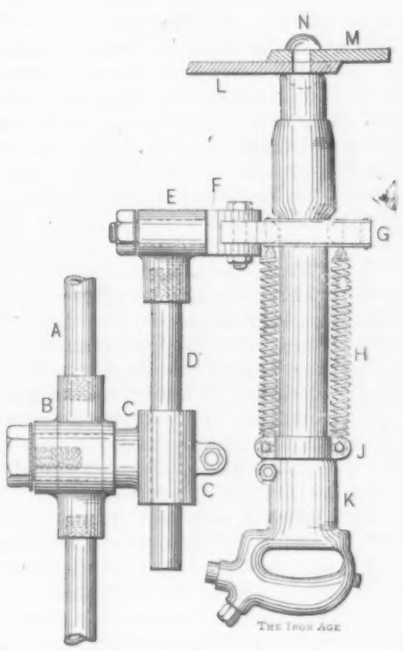


Fig. 2.—Detail, Showing Spring Suspension of the Hammer.

Crowe Name Plates.—The Crowe Metal Mfg. Company, 71 West Jackson boulevard, Chicago, have recently begun the manufacture of name plates and advertising metal cards by a new process, which is named the Crowe process and involves the use of patented labor saving special machinery. By this process the company state that they are enabled to place within the reach of those who need it an inexpensive, ornamental and indestructible advertising metal card. Their products are name plates embossed, name plates stamped, metal tags and labels and souvenirs. They also do die sinking, engraving, embossing, dial faces and press work. They offer ten styles of standard finishes of brass, four styles in aluminum, three styles in special finishes plated, two syles in special finishes not plated, and gold and silver finishes in all combinations to order. The holes will be centered and sized as required. The company have issued a very attractive catalogue showing samples of name plates printed in black and gilt in a great variety of sizes, shapes, designs and lettering. The catalogue also contains diagrams of combinations, of which those shown on three pages produce over 900 distinct plates.

The New England Foundrymen.

There was a large attendance at the March meeting of the New England Foundrymen's Association at the Exchange Club, Boston, Wednesday, the 9th inst. The usual excellent dinner was served, and before and after the members listened to interesting papers, the first by Herbert E. Field of Ansonia, Conn., secretary of the Metallurgical Section of the American Foundrymen's Association; the other by Paul Kreuzpointner of the Altoona shops of the Pennsylvania Railroad.

Mr. Field's subject was "Defects in Cast Iron; Their Causes and Remedies." A discussion followed in which a number of members participated, as did also Mr. Kreuzpointner, whose expression of views did much to cause an interesting argument on the causes of cold shut in castings, concerning which a wide difference of opinion was manifested. Mr. Kreuzpointner's own paper was entitled "Trade Education in the Foundry," and he surrounded the text of his talk by a discussion of the general subject of trade schools as a necessary adjunct to the industrial prosperity of the country, comparing those in the large industrial centers of the United States with the great number in some of the German cities. Upon the conclusion of his paper Prof. W. W. Bird, head of the department of merchanical engineering of the Worcester Polytechnic Institute, was called upon and gave a brief but interesting talk, expressing his own views along the lines of Mr. Kreuzpointner's discourse. Charles L. Newcomb of the Deane Steam Pump Company made brief remarks on the subject.

Announcement was made of the deaths of Loren H. Stannard of the firm of E. Stannard & Son of New Haven, Conn., and S. K. Lovewell of Chelsea, Mass., and President Bartlett M. Shaw appointed committees to prepare resolutions, the committee on Mr. Stannard consisting of F. B. Farnsworth and E. E. Durrant of New Haven, and the committee on Mr. Lovewell, John Magee, George H. Gibby and George H. Lincoln of Boston.

Smith & Wallace of Woburn, Mass.; the Sullivan Machinery Company of Claremont, N. H., and T. P. Kelly & Son of New York were elected to membership.

President Shaw announced that the association had been invited by the Brown & Sharpe Mfg. Company of Providence, R. I., to visit their works on May 11, and that the occasion would take the place of the May meeting. The day will include dinner at one of the Providence hotels.

The Eight-Hour Hearings Limited.

The Pending Bill Criticised as Unconstitutional.

WASHINGTON, D. C., March 15, 1904.—The House Committee on Labor, at sessions held on the 10th and 11th instant, heard arguments for and against the pending eight-hour bill, and in executive session decided upon a programme for the further consideration of the measure under which the hearings will terminate on the 26th instant and the bill will then be taken up for a final vote. In the meantime parties desiring to appear against the bill will be heard on the 17th, 22d and 24th instant, while those favoring the measure will be heard on the 23d and 25th. The 26th has been reserved for general legal arguments, the time to be divided equally for and against the bill. In view of the large number of manufacturers and others who regard this bill as threatening serious injury to the industries of the country, and who desire to enter their protests against it, the committee's programme is regarded as wholly inadequate and efforts will be made to extend hearings beyond the date fixed for their termination.

Hitt Bill Criticised.

The meeting of the committee on the 10th instant proved one of the most important sessions since the bill was taken up. The principal witness heard was William H. Fletcher, of the W. & A. Fletcher Company, proprietors of the North River Iron Works, Hoboken, N. J., who presented a most convincing argument against the eight-hour bill as applied to plants engaged in the construction of engines and boilers and in the building and repairing of ships. A protest against the bill was submitted by DeCourcey May, on behalf of the New York Shipbuilding Company, Camden, N. J.

The most notable incident of the meeting, however, was the appearance of Representative Sulzer, of New York, who, while professing to favor strongly the movement for the passage for an eight-hour bill, denounced the pending measure, introduced by Representative Hitt, of Illinois, at the request of President Gompers, of the American Federation of Labor, as unconstitutional and urged the committee to report the so-called Sulzer bill as a substitute. Mr. Sulzer stated that a representative of the American Federation of Labor would testify before the committee that the Sulzer bill, and not the Hitt bill, was desired by that organization, and although no one appeared to support Mr. Sulzer's statement, yet six or eight representatives of the American Federation of Labor, including Third Vice-President O'Connell, who was placed in charge of this measure when Mr. Gompers went to Porto Rico, remained silent throughout Mr. Sulzer's remarks, and apparently acquiesced in what he said.

As pointed out later by Chairman Gardner, Mr. Sulzer's declaration leaves the pending legislation in a very peculiar position. The Senate Committee on Education and Labor, in reporting the so-called McComas bill in the last Congress, declared that the House bill, which was identical with the measure of which Mr. Sulzer now claims the authorship, was wholly unconstitutional and required to be materially modified by the Senate Committee. The measure now before the House Committee is the McComas bill, and this in turn has been denounced by Mr. Sulzer, a professed advocate of eight-hour legislation, as being unconstutional in several important particulars. Both bills, therefore, have been condemned by ardent friends of this kind of legislation, and, as Mr. Gardner points out, the House Committee may be pardoned for hesitating to make a favorable report upon any of the pending measures.

Mr. Fletcher's Testimony.

Mr. Fletcher stated that in addition to appearing for his company he came as the representative of the New York Metal Trades Association. His company's business was the construction of marine engines and boilers and the building and repairing of ships. Conditions prevailing in this particular industry, he said, differed from those of almost any other in the country, and for this reason the proposed legislation would affect this industry more disastrously than any other. After dwelling at some length on the difficulties to be encountered in dealing with subcontractors, he continued:

"Now, I object very strongly to legislation that assumes that mechanics in a manufacturing business are the only working men. I am just as much a working man as any one who works in my shop, and when I go home at night I carry my business with me, which he does not. Not only do I worry about my own work, about the production of my machinery, about the result to be obtained in the speed of a vessel, about the outcome of our contracts, whether at a loss or at a profit, but I have got to worry about how my men are going to do their work. I have got to worry about what will be the next demand he is going to make on me with this contract on hand. I am just as much of a working man as he is, and I object to any such discrimination as is embodied in this bill.

"A man who toils with his hands is no more a laborer than he who toils with his brains, and the man who comes here and tells you anything different tells you something false. Is he entitled to any more consideration than I am? Does he do any more for the country? Have the advancement and growth of this great country been due to labor organizations? No. They have been due to the individual industry of the citizen in this country. The lowest man may raise himself to the highest position if he has the ability. The man who works in the shop in the day time and studies at night at Cooper Union, or some other institution, acquiring technical knowledge along with his practical knowledge, is the man who rises in his position and not the man who depends on his lodge. He is the man who has made this country. No interference on the part of the Government in the business of this country will aid in the march of progress. You will simply impede it."

Referring to labor conditions in other countries, Mr. Fletcher warned the committee that legislation shortening the hours of labor and stimulating labor organizations to urge further enactments could not fail to result in depriving us of all our opportunities for foreign trade. In this connection, he said:

"The trade of England is slipping away from her, and where is it drifting? Gentlemen, keep your eyes on Ger many. We have been exporting machinery to Germany and elsewhere, and what have they been doing with it? They have been taking it apart and duplicating each particular piece, as Chinamen do, and they are doing it with cheaper labor. They will take our market from us if you handicap our manufacturers. Do not interfere with business. Let it alone. Legislate for the general welfare of the country, but let the laws of trade and natural conditions take care of themselves. You cannot say when a man shall plant his corn, because he is controlled by a natural law. You cannot say what shall be done by labor, because that is controlled by a business law."

The "Poor Workman."

"It is all very well to come here and talk about the 'poor workman.' I know something about the poor workman, and I sympathize with him just as much as any man here. But it is not sympathy he is looking for; he does not want charity; he wants work. Don't prevent him from getting it! Work is what makes him independent, and when you put handicaps on business you stop his work. Take my word for it that we understand the business we are running. We and our workmen are working for a common cause. I have been in business for 30 years, and my father was in it all his life before me, and I have no more than just enough for a decent living. We have not robbed anybody, and we do not propose to do so, but we want an opportunity to do a legitimate business without governmental interference."

Mr. Fletcher was asked whether his company was connected in any way with the ship building trust, to which he replied in the negative, adding that he believed when it was organized it was foredoomed to failure. It was then suggested that the so-called Steel Trust was an illustration of an overcapitalized combination which did not fail. In reply to a question as to whether, in his opinion, the Steel Trust should not have used some of its profits in increasing the wages of its employees, Mr.

Fletcher said that he knew very little about the trust's business, and added:

"I will tell you, however, one thing that the Steel Trust did that has come under my observation. We had three years of good, prosperous business times. Everything was booming. At one time it was impossible to get plates and ship anchors and beams or anything of that kind, products which the United States Steel Corporation manufacture. In the past it has always happened that in busy times the American steel manufacturer marked his prices up. Plates have been run up to 3 to 3½ cents a pound. But under the trust the purchasing power of a dollar was not curtailed to any extent, and there has been very little change. You can now buy the best steel that is made in the world for putting in marine hulls for less than 2 cents a pound, cut to shape and delivered at your shop."

President De Courcey May's Statement.

On behalf of the New York Shipbuilding Company President De Courcey May said in part:

"We desire to protest most earnestly against the passage of this bill. It is absolutely impossible to conduct a ship yard in which Government work is done on an eight-hour system and commercial work on a ten-hour basis. It is hardly necessary to go to any length to prove this; it is obvious to any one who has had any experience in ship yard management that it is impossible to work the two systems in conjunction. The question of time keeping and the breaking up of the discipline alone would add greatly to the cost, and result in disorder. . . .

Shorter Hours Will Kill Industry.

"It is folly to say that if the hours are shortened more men will be employed; if the hours are shortened the shipbuilding industry in this country will disappear. I say this advisedly, and know whereof I speak. Last year the late president of this company entered a protest against a bill, similar to the one you are now considering, in which he stated that this company, the New York Shipbuilding Company, had expended during the last few years nearly ten million dollars in producing a plant which was credited with being one of the best equipped in the world, and it was hoped under normal conditions that this plant, with its modern tools and equipment, could build ships as cheaply as any plant in this country, and perhaps, when materials were low enough in price, be able to compete with foreign built vessels. This plant has now got its force organized and is in good working order, running smoothly, and with all of its employees, so far as we know, thoroughly contented. The passage of an act such as you are now considering would mean ruin to this industry. Inasmuch as we use machinery, as far as possible, in the construction of vessels, it is all important that these tools be constantly employed, and the restricting of the hours of labor means such a diminution of the output as would make the continuation of shipbuilding in this particular yard a matter of only a short time. We also protest against the un-American interference with the right, which every man has, to work just as long or short a time as he pleases."

W. L. C.

The National Tube Company's Lorain Works.—A recent issue of the Cleveland *Leader* gives a number of illustrations of the building now in course of erection for the National Tube Company's new tube mills at Lorain, Ohio. Contracts were awarded to the Oscar Daniels Company, Chicago, for 38 separate jobs, and ground was broken in June, 1903. The contracts included the steel construction on practically all the buildings, including two new blast furnaces, besides additions and improvements to the old works of the Lorain Steel Company. The property of the National Tube Company extends from the docks on the Black River 2½ miles eastward, and includes in round figures 1000 acres. Of this contract 600 acres are already taken up with the buildings now under construction. These buildings are intended for various purposes, among them being four lap weld mills. Of these Nos. 1, 2 and 3 will be the same size—namely, 98 feet wide by 679 feet long. No. 4 is the largest, being 725 feet long. The butt weld mills are five in number, and are equally large. The skelp mill is 80 x 746 feet. The machine shop is 110 x 500 feet. The contracts stipulate that all the mill buildings shall be finished by March 1 of next year. In the construction of these buildings 15,000 tons of steel will be used.

The Reese-Hammond Fire Brick Company Reorganization.

A plan for the reorganization of the Reese-Hammond Fire Brick Company and allied corporations and firms has been promulgated by James S. Beacon, secretary of the Reorganization Committee, Greensburg, Pa. The plan contemplates a new corporation under the laws of the State of Pennsylvania, under the name of the Reese-Hammond Fire Brick Company, Incorporated. All the stockholders and unsecured creditors of the several concerns proposed to be included in the plan of reorganization are requested to deposit their stock certificates or claims, as the case may be, with the Reorganization Committee and execute the reorganization agreement. A large percentage of the creditors have already signed the agreement.

The consolidated assets of the several interests included in this plan are appraised at $543,300 on property account; $489,334 on mines, real estate, office furniture, &c., and investments and current assets at $277,058.53, making a total of $1,339,459.67. The total liabilities are placed at $789,201.54, which would leave an apparent surplus of $550,258.13.

The proposition made is to issue general mortgage 6 per cent. 15-year gold bonds amounting to $900,000, these bonds to be redeemable at the option of the new company after three years on payment of principal and accrued interest. Of these bonds, the first series of $150,000 is to be sold by the Reorganization Committee or the new company to secure the necessary funds to provide working capital and pay laborers' claims, mechanics' liens, taxes, &c. To the holders of the second mortgage bonds of the Reese-Hammond Fire Brick Company it is proposed to devote $117,000 of the new bonds, as additional collateral security for the indebtedness for which the former bonds are now held. The remainder of the issue is to be paid to the holders of the unsecured indebtedness at 90 cents on the dollar.

To assure the continuity of an efficient and proper management for a sufficient length of time to rehabilitate the affairs of the company and to improve their properties and develop their business, a voting trust of the entire capital stock will be created. The voting trustees will be seven in number, and will consist in the first instance of the present members of the Reorganization Committee, as follows: James S. Beacon, James Allport, F. J. Dyer, W. F. Soisson, John H. Waters, James S. Campbell and Roland D. Swoope.

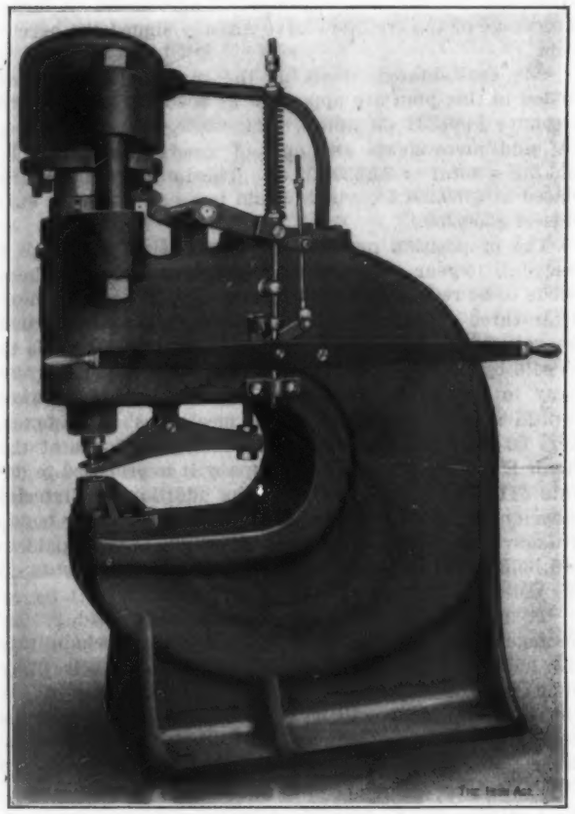
The properties to be included in this reorganization plan are those belonging to the Reese-Hammond Fire Brick Company, Curwensville Fire Brick Company, United States Enameled Brick Company, Hammond Fire Brick Company, Hammond, Berkey & Co. and Pennsylvania & Kentucky Fire Brick Company.

Chinese Railway Regulations.—The Department of Commerce and Labor has issued a translation of the revised regulations for railway construction in China furnished by United States Minister E. H. Conger, Pekin, China. These regulations are exceedingly interesting. They are given in very simple form and appear to be exceptionally sensible. The gauge adopted for China's railways is the standard gauge of 4 feet 8½ inches. As indicating the general tone of the regulations, Article XIV is herewith reproduced:

If at any place in any of the provinces where railways are in construction land owners shall raise the price of land, thus hindering or causing trouble, or if workmen, depending upon numbers, shall constitute a boycott (*i.e.*, probably in order to secure unreasonable wages), it will be permitted the company to make a clear report of the matter to the local authorities, who shall issue a strict proclamation, suppress the disturbance, and prohibit, under severe penalties, all extortionate practices of yamen underlings. It must be known that railways are the foundation of commercial prosperity and profitable transportation, as well as an important enterprise of the Imperial Government. If the said local officials prove unable to give protection and evade their responsibilities, on investigation, if the facts be as reported, they shall be impeached and dismissed.

The No. 1 Bement Hydraulic Punch.

Hydraulic punching and shearing machines are coming into more general use at the present time, owing to their superiority in many respects to belt or motor driven machines. They are noiseless in operation, have few wearing parts, and are of very heavy construction. The cost of maintenance, too, is lower than for power driven machines, as they only take power when they are doing work, and are always ready, there being no heavy fly wheels which have to be started and got up to speed. Another important point in favor of hydraulic machines is the fact that they are not likely to be broken when used for work beyond their capacity, as the punching load is limited to a definite value and cannot be increased. The frames are constructed to stand with safety the capacities of the cylinders, and should plates of an excessive thickness be put under the punch an excessive strain on the frames could not be produced, from the fact that the pressure is fixed. With power driven machines, however, the momentum of the large fly wheels and gears is likely to put an undue strain on the frame when it is attempted to punch a piece which is beyond the capacity of the machine.



BEMENT QUICK ACTING HYDRAULIC PUNCH.

The machine illustrated is a No. 1 Bement quick acting hydraulic punch, having sufficient power to punch a ¾-inch hole in a ⅜-inch plate; or, in other words, it is capable of exerting a pressure of 32 tons at 150 pounds per square inch. It is designed for 25 strokes per minute, and is equipped with a valve control that causes the head to descend when the lever is pulled and then to return automatically to the top of the stroke and stop until the valve is again operated. The downward motion is effected by water pressure, while a spring inside the head brings the plunger back to the top of the stroke. In the larger machines the spring is replaced by a hydraulic push-back piston. If desired, the machine may be made to run automatically as well. The cylinders are outside hemp packed, with the usual glands, giving ready access for repacking without dismantling the machine. The valves are of the Bement standard poppet type, made of hydraulic brass, and are likewise packed with hemp. No leather packings are used. The machine is built by the Bement-Miles Works of the Niles-Bement-Pond Company.

Notable among the many new boiler shops which have been equipped with hydraulic punching and shearing machines are the East Moline shops of the Chicago, Rock Island & Pacific Railroad, where practically all the equipment is hydraulic. It includes a 60-inch punch, a 54-inch shear, a 36-inch die block punch, a 25-inch punch, an angle shear, a universal shear, a horizontal flange punch, a quick acting 20-inch punch, a universal flanging press, and a 17-foot triple pressure riveter, all of which are hydraulic and were built at the Bement-Miles Works at Philadelphia, Pa.

The Canadian Mining Institute.

TORONTO, CANADA, March 10, 1904.—The annual convention of the Canadian Mining Institute, held for the first time in this city last week, is likely to have an important bearing on the mining industry in this province. The convention has hitherto been held in Montreal, and its meeting in Toronto is an indication of the growing importance of the mining interests of the province of Ontario. The principal significance of the gathering, however, was in the facts adduced showing the vital necessity of a change in the mining policy of the province, as evinced by the meager and disappointing results in the way of practical development as compared with the amount of prospecting and location of mining claims.

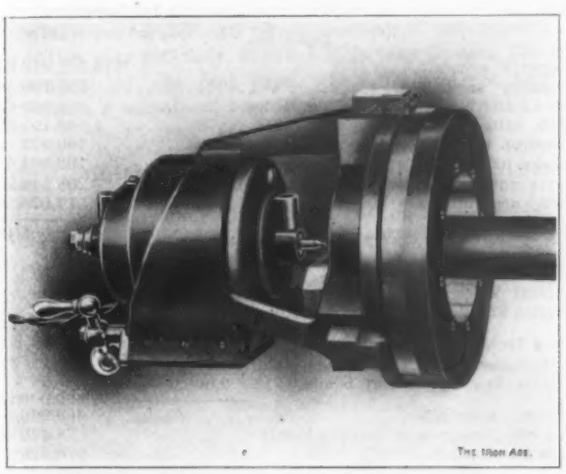
A paper by A. B. Willmott of Sault Ste. Marie on "The Exploration of the Iron Ranges of Ontario" was read. After referring to the similarity of the geological formations between certain belts in Northern Ontario and those found south of Lake Superior, he contrasted the small amount of work done in Ontario, where the Hamilton, Sault Ste. Marie and Midland furnaces had only one large producing mine to draw on, as compared with the productiveness of the American iron deposits to the south. He held that the lack of known ore bodies on the Canadian side was owing to the fact that they had not been properly sought, and went exhaustively into a presentation of the best methods of interpreting and verifying surface indications. He instanced the Josephine and Frances mines as cases in which surface indications were but slight, but where deep drillings had successfully shown the value of the deposits. During the past two years some intelligent and systematic work had been done in Ontario, on the Steep Rock, Animikie, Michipicoten and Hutton ranges, and in most cases good ore bodies had been discovered. The iron ranges had been found, and the question to be settled as to what was at the bottom of them could only be solved by careful, intelligent work.

The salient feature of the convention was an animated discussion of the provincial mining laws, which were blamed by some for the slow progress of the industry. Eugene Coste, the president, in his address stated that the tendency of existing regulations was to lock up the good mining lands in the hands of speculators. He stated that although during the six years ending with 1902 no less an area than 411,000 acres of mining lands had been granted to applicants in the province of Ontario, yet at the close of that year only some 4000 acres were being operated. He suggested as a remedy continual annual assessment work on all lands granted of $4 or $5 per acre.

A very keen debate followed, the result of which has been to call widespread attention to the existing unsatisfactory situation. Since the convention closed the press has taken up the question. The Toronto *Globe*, an organ of the provincial administration, strongly urges an amendment of the law so as to prevent mineral lands being held unworked. It says there is reason to believe that United States owners of iron mines and ore carrying steamers, foreseeing a comparatively short life for their own ore deposits at the present rate of working, would like to get possession of Ontario ore deposits to hold for future development, and that mineral lands should be sold only after some effort has been made to discover their value and then only to those who will undertake to work them within a reasonable time.

A Portable Centering Device.

A light, portable machine for centering shafting of all forms, round, hexagonal, &c., is shown by the accompanying engraving. It departs from the usual method of centering bars for lathe work, inasmuch as the device is carried to the bar wherever it may be lying, instead of carrying the heavy bar to a centering machine. It consists of a frame of aluminum compound, at one end of which is fitted a universal chuck, while the other end supports a motor, with a drill and countersink mounted on its shaft and aligned with the center of the chuck. The motor rests on a gibbed slide and is traveled by a feed screw and handle, causing the drill and countersink to enter the end of the bar. Wear and play are taken up by means of slides and set screws, shown at the base of the casting. A stop across the inside of the chuck opening prevents the drill point from being



A PORTABLE ELECTRIC MACHINE FOR CENTERING SHAFTING.

brought into contact with the end of the bar too suddenly if handled carelessly. The motive power, direct current at 110 volts, may be obtained from an electric light fixture or a small storage battery, and is controlled by a switch on the rear of the motor.

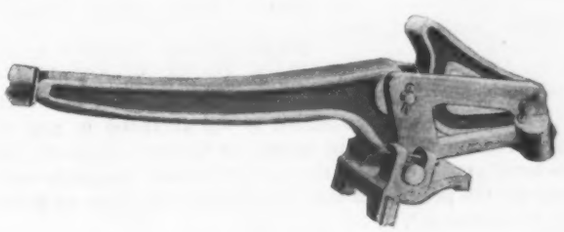
The machine is made in different sizes for large or small work. The one shown, capable of centering bars up to 4 inches in diameter, is 10 inches long, the outside diameter of the chuck is 8 inches and it weighs about 25 pounds. The work is done accurately and speedily, and if the bar happens to have cropped or rough ends it does not need to be cut square before centering. Frank H. Hudson, 110 State street, Boston, Mass., is the inventor of the machine.

Car Shortage in the Pittsburgh District.—The manufacturing interests of Pittsburgh, particularly those in the Connellsville region and the Monongahela Valley, are suffering very severely at the present time from a car shortage, which seems to be steadily growing worse. In the Monongahela Valley the Pittsburgh Steel Company, National mills of American Sheet & Tin Plate Company, Page Woven Wire Fence Company and other concerns have a very large amount of finished product ready for shipment, for which they are unable to get a full supply of cars. In the Connellsville region the coke operators are seriously handicapped, and in some cases recently have been compelled to ship foundry coke in rack cars instead of box cars. When shipments of foundry coke are made in rack cars the consignee usually demands a reduction in the regular price, as the coke is more or less injured in transportation by the elements. The railroads claim to be doing all in their power to relieve the shortage, and the principal explanation given for it is that a large number of cars have been diverted to the grain trade. The entrance of the Wabash Railroad into the Pittsburgh district is eagerly awaited by the manufacturers in that city, as it will no doubt lessen to some extent at least the car shortages which invariably come up in the Pittsburgh district when business is in normal condition. While the claim of the railroads, that much of the trouble about getting sufficient cars is due largely to the physical position of Pittsburgh, may be to some extent true, yet it is a fact that for years the railroads entering that city have seemed to underrate its capacity for turning out tonnage.

A New Implement for Moving Cars.

Owners of side track who have cars switched to their doors know how often it is desirable to move a car a short distance when a switch engine is not available to do the work. The double clutch car mover, of which the accompanying is an illustration, has been devised for just this purpose, and is manufactured by the Walter A. Zelnicker Supply Company of St. Louis, Mo.

One of the first means for moving cars by hand was the common pinch bar, but it usually required the use of two or more bars, with several men to manipulate them, and the work was slow and laborious. From this was evolved a pinch bar having a wedge or bit that acted as a fulcrum. This was an improvement over the ordinary bar, but it still had the fault that the bit or wedge would slip on the rail, and even when a firm bite was secured it tended to lift the wheel. This double clutch mover acts on a different principle that is said to eliminate the former objections. Instead of the bit striking the rail on the top, where it has become case hardened, it grips the softer edges of the rail, giving a firm fulcrum for the leverage. Another important feature is the movable shoe, which is made concave to fit the rim of the wheel. By its peculiar construction, and being hinged at the lowest point, this shoe has an upward and forward movement, and as its top is at the outer end of the circle of which the hinge is the center the movement is more rapid. The motion is imparted to the wheel by a long lever working on a short



THE DOUBLE CLUTCH CAR MOVER.

arm from a rigid base, enabling a single workman to move a loaded car up a considerable incline even on an ice covered track.

The double clutch car mover is made of malleable iron and cast steel, with special high grade tool steel bits, which can be readily sharpened. It weighs only 18 pounds, and is, therefore, a convenient tool to handle.

The manufacturing industries at Youngstown, Ohio, are more fully employed at the present time than for some months. At the largest plant, this being the Ohio works of the Carnegie Steel Company, two blast furnaces are going, a third is being prepared for blast and a fourth stack is under erection, but which will not be ready until May or later. The Ohio Steel Works are running full on sheet and tin bars, which are shipped to the sheet and tin plate mills of the American Sheet & Tin Plate Company in the two valleys. The Republic Iron & Steel Company have three finishing works at Youngstown, these being Andrews Works, Brown-Bonnell Works and Mahoning Valley Works, all of which are in operation. The Bessemer steel plant at Youngstown is also running. The Republic Company have two blast furnaces at Youngstown, Hannah and Haselton, the former being in blast, while the latter is being gotten ready and will blow in at an early date. The finishing mills of Carnegie Steel Company in the Youngstown district are all on in full, and also the plant of the Youngstown Iron Sheet & Tube Company. The sheet mills and roofing department of the

Youngstown Iron & Steel Roofing Company are being operated to full capacity. Most of the foundries and machine shops in the Youngstown district are more fully employed than for some months.

The Sloss-Sheffield Steel & Iron Company.

The annual report of President J. C. Maben of the Sloss-Sheffield Steel & Iron Company for the fiscal year ending November 30, 1903, has been submitted to the stockholders. Omitting some minor details, the report is as follows:

The fiscal year of the company, which closed November 30, 1903, was marked by extreme fluctuations in the iron market, not only in the price of pig iron, but in the demand and the urgency of delivery. The price steadily declined from the high point at the beginning of the year until it reached $9 on the basis of No. 2 foundry, and with the declining price the demand slackened. In no month during the year until October was reached did the sales even approximate the make of iron, so that at the close of the fiscal year we were carrying over 90,000 tons on our yard.

The heavier sales having been made after the sharp decline in price, the average price for all the sales of the year was only 71 cents more than in 1901 and $1.03 less than the average for 1902. Our deliveries of iron during 1903 were 83,633 tons less than our production, which lessened our profits for the year, as no profit is computed on iron until it is shipped.

The following statement of the prices realized for iron in the last four years and the profits for each year is made in order that the stockholders may realize the steady growth and improvement in the business of the company. It will be noted that while the price realized for iron in 1900 was 12 cents a ton higher than last year, the profits from the same for last year were $396,294 greater:

	1903.	1902.	1901.	1900.
Average price of iron shipped	$13.66	$12.25	$10.51	$13.78
Profit on iron shipped	1,139,146	932,492	311,407	742,852

The operation of the Lady Ensley Furnace, of which the company own two-thirds, is not included in any of the foregoing statements, except as to the amount of iron on hand at the close of the year, although the price realized for the product of this furnace was the same as given in the statement.

The profit on coal and coke also shows an increase of $184,206, as compared with 1901, and of $153,717, as compared with the year 1902, which is due to the increased product and improvements at the mines.

The last of the 200 coke ovens which were building at the Flat Top Mines were not completed until two months before the close of the fiscal year; yet the production of coke increased 96,147 tons over the previous year, and 210,000 tons over 1901, or over 61 per cent. in two years. Our coke capacity is now amply sufficient to supply all seven furnaces.

	1903. Tons.	1902. Tons.	1901. Tons.
Pig iron	311,093	287,685	218,857
Coal	1,501,956	1,287,826	1,042,298
Coke	549,201	453,054	339,199
Brown ore	260,539	298,700	234,661
Red ore	377,080	284,482	221,789
Dolomite	115,635	101,069	101,349

The above figures of pig iron do not include the product of the Lady Ensley Furnace, which produced 37,057 tons in 1902 and 51,330 tons in 1903.

As was indicated in the last annual report, in April last a clear title to the Lady Ensley property, which had been in ligitation for over nine years, was vested in this company by the court. The company having from time to time purchased all of the liabilities of the corporation, consisting of $2,000,000 mortgage bonds, $2,000,000 stock, and a large amount of judgments, bought the property at the foreclosure sale. The property consists of 16,000 acres of brown ore lands, partially developed, with ore washers, steam shovels, &c., and 14,000 acres of coal lands, a large proportion of it carrying the big seam, 7 feet in thickness, with a going mine on it, having a capacity of 1000 tons a day, a coal washer, miners' houses and 200 coke ovens.

The Lady Ensley property was acquired at a cost of $620,612.49, which could have been done only by the purchase of the liabilities from time to time, at greatly depreciated prices, while the company were in litigation. It was paid for out of earnings and no securities were issued. Until legal possession of the property was had it did not appear in the statement of property account, as it was held in the name of a trustee, but the trustee account has now been closed and property account charged with the exact amount which was paid in cash in the acquisition of the property. But for this transfer of accounts the increase in working capital would have shown larger for the year. We paid out for real estate (not including the Lady Ensley property), repairs to furnaces, and improvements at the mines, $425,893 during the year.

Annexed will be found statements of resources and liabilities, earnings for the year ending November 30, 1903, and of working capital employed in business:

Resources.

Property account		$18,311,416.84
Treasury securities		259,700.00
Stocks and bonds of other companies		311,994.67
Cash, bills and accounts receivable		1,149,192.33
Supplies, raw and finished material at cost		790,071.12
Stocks in company's stores and warehouses		192,004.02
Extraordinary repair and renewal fund		208,548.29
Insurance and taxes, unexpired		17,078.18
Total		$21,240,005.45

Liabilities.

Capital stock, preferred	$6,700,000.00	
Capital stock, common	7,500,000.00	
		$14,200,000.00
Sloss Iron & Steel Company:		
Mortgage 6 per cent. bonds, 1920	$2,000,000.00	
Mortgage, 4½ per cent. bonds, 1918	2,000,000.00	
		4,000,000.00
Current accounts		469,646.37
Pay roll (balance of current month)		78,468.65
Bills payable		176,128.12
Profit and loss		2,315,762.31
Total		$21,240,005.45

Profit on pig iron delivered*, after deducting for depreciations on iron ore and 25 cents per ton on iron for extraordinary repairs and renewals.	$1,139,146.59
Profit on coal, after deducting for depreciation	216,265.38
Profit on coke	175,961.02
Ore and dolomite sales	64,342.86
Rents, royalties, stores and other revenues	208,939.49
Two-thirds of earnings of North Alabama Furnace Company	58,387.92
	$1,863,043.26

Deductions.

General expense, accounts not charged in cost sheets	$35,616.31	
Taxes and license	31,786.27	
		$67,402.58
Net earnings		$1,795,640.68
Year's bond interest		210,000.00
Surplus for 1903		$1,585,640.68
Year's dividends, 7 per cent. on preferred stock		469,000.00
Surplus for year 1903, after dividends		$1,116,640.68
Net surplus from 1902, after dividends		1,199,121.63
Surplus, November 30, 1903		$2,315,762.31

Working Capital.

Cash, bills and accounts receivable	$1,149,192.33
Raw and finished material on hand, at cost	688,035.14
Merchandise and supplies in company's stores and warehouses	294,040.00
Insurance and taxes, unexpired	17,078.18
Treasury securities, stocks and bonds, at market value	397,839.45
	$2,546,185.10

Contra.

Bills payable	$176,128.12	
Pay rolls (balance of current month)	78,468.65	
Accounts payable (current business)	469,646.37	
		$724,243.14
Balance working capital in business		$1,821,941.96

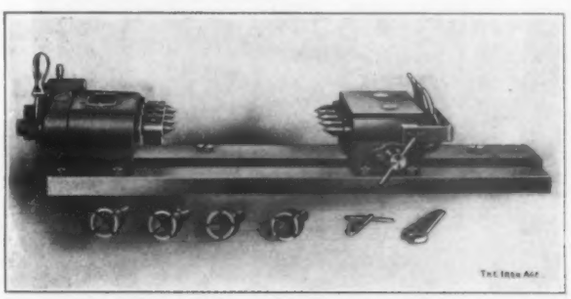
* Product of Lady Ensley not included.

An Improvement in the Howard Watchman's Clock.—The E. Howard Clock Company of Boston, Mass., have designed a new needle for their watchman's clock for perforating the paper dial when the watchman registers. In some large buildings the watchman must

make a hurried round, a practice which the Howard Company discourage when possible, because the greatest efficiency on the part of the watchman cannot be obtained when he goes too rapidly from one station to another. But as such instances do occur the company have made a change in the registering device of their clocks. The blunt point ordinarily used with their apparatus does not penetrate the paper but indents it, spreading the texture, so that when stations are rung in rapid succession the indentures run one into the other, making it difficult to read them. The Howard system enumerates the stations by punctures—that is, No. 1 station registers one puncture; No. 5, five punctures; No. 14, a puncture, a wide space and then four punctures close together, a great advantage of this being that no watchman could accomplish the registration of a box, otherwise than from its station, by getting track of the wires and causing a contact. He could register, but he would not space as the mechanism spaces, and any such attempt would be easily detected. But with a blunt point when two stations are registered in rapid succession the two merge on the dial. The substitution of a sharp needle, which perforates the paper instead of indenting it, obviates this difficulty, because it is easy to read the registration of the dial even when the stations are rung within a minute of one another, or even less.

Multiple Centers for Milling Machines.

An attachment for use on milling machines or shapers, consisting of multiple centers for the support of duplicate pieces of work, is illustrated herewith. It is designed to effect economy in time in the fluting of taps, the cutting of grooves in reamers and like work. The spindles



THE GARVIN MULTIPLE CENTER ATTACHMENT.

of the centers are geared together and indexed simultaneously, one dial serving for all. The tail spindles are thrown forward independently by springs, with a separate lever for each, but are all locked simultaneously by the one handle at the side. The tail stock is adjustable along the base plate, and may be clamped at any point.

The head and tail spindles are bored with Morse taper holes, and the head spindles are provided with two sets of centers, male centers carrying dogging jaws and female centers having bell mouth openings in which four grooves are cut. The latter centers hold the squared end of a piece of work centrally, while the grooves engage the corners of the square so that the work may be dogged around without the necessity of being otherwise clamped. The centering attachments are made in two sizes by the Garvin Machine Company of New York.

The National Steel Foundry Company.—After unusual delays through unfavorable weather and the non-arrival of supplies, the first heat was made on the 10th inst. at the plant of the National Steel Foundry Company, at New Haven, Conn. The corporation were organized a year ago, and ground was broken for the foundry on June 2, 1903. It was designed by J. A. Herrick of Philadelphia, consulting engineer, whose contract was for two 25-30-ton open hearth furnaces, one double ladle heater, five 10 x 13 gas producers, two stacks 100 feet high, bell bottoms, with burn out valves and flues. It included also one double oven 18 x 36 feet long, four single ovens 12 x 36 feet long with double doors, a large stack flue which passes below the center of all the ovens and serves them all, the flue leading to a third large stack, brick lined, which will serve added ovens and another annealer later on. The foundry building is 408 feet long, 165 feet wide and 57 feet high. The foundry is provided with four electric traveling cranes, three being of 30 tons capacity, and one of 40 tons capacity. The officers of the new company are: President, Henry L. Hotchkiss of the L. Candee Company; vice-president, Frederick B. Farnsworth; treasurer, H. Stuart Hotchkiss; secretary, Eugene Buckman, and manager, M. Sims.

Steam Turbine Efficiency.

Data on the performance and efficiency of steam turbines have for the most part been far from perfect and complete. It is, therefore, gratifying to review the results of an extensive test recently made on a 1250-kw. Westinghouse-Parsons turbine, as given in a recent issue of the *Electrical World and Engineer:*

The turbine was of the two-cylinder multiple expansion form, arranged in tandem compound, and direct connected to a revolving field type generator, delivering three-phase 60-cycle current at 11,000 volts when running at a speed of 1200 revolutions per minute. The unit is the first of three to be furnished to the Interborough Rapid Transit Company for the illumination of the New York Subway. The contract guaranteed that with a 175-pound steam pressure at the throttle and a vacuum of 27 inches in the exhaust the consumption of steam at various loads should not exceed the following:

	Pounds per E. H. P.—Dry saturated steam.	Pounds per E. H. P.—Steam superheated 75° F.
Full rated load	15.7	13.8
¾ rated load	16.6	14.6
½ rated load	18.2	16.2
¼ rated load	23.2	20.8

The results actually obtained were as follows:

Load in kilowatts.	Fraction of full load.	Consumption per E. H. P.	Pounds steam per equivalent I. H. P. of a reciprocating engine.
With dry saturated steam and 27 inches vaccuum.			
196.95	0.158	27.08	12.78
342.73	0.276	21.18	12.89
655.98	0.525	17.14	12.82
989.53	0.79	15.27	12.49
1,321.46	1.06	14.52	12.44
1,988.9	1.59	15.21	13.69
With 75° F. superheat and 27 inches vacuum.			
333.55	0.267	20.51	12.34
664.67	0.531	15.9	11.94
986.23	0.79	14.45	11.81
1,293.9	1.038	13.78	11.77
With dry saturated steam and 28 inches vacuum.			
334.78	0.268	20.71	12.48
972	0.778	14.91	12.09
1,363.95	1.091	14.02	12.07
With 75° F. superheat and 28 inches vacuum.			
333.15	0.266	18.86	11.33
977.64	0.78	13.87	11.31
1,274.2	1.02	13.17	11.23

The first set of conditions shows that the results were considerably better than were guaranteed, and it should be mentioned also that they were obtained with a steam pressure of 147 pounds instead of 175, because the latter was not available. The tests made under the other conditions were in the interest of general information. It is so usual to define steam engine economy in terms of the indicated horse-power that, to put the turbine on a more readily comparable basis, the last column of figures was deduced, allowing the combined efficiency of an equivalent engine and generator to be 85 per cent. and assuming the losses constant at all loads. These are fair assumptions which if anything favor the steam engine.

To test the speed regulation a load of 1309 kw. was suddenly thrown off by opening the exciter current, with the result that the speed increased but 2 per cent. A load of 1342 kw. was then thrown on and a speed variation of 2.2 per cent. in the opposite direction followed. The safety stop, which is provided with the turbine to prevent its racing if the governor fails to act, proved its efficacy by stopping the turbine at an increase of 14.35 per cent. above normal speed when the governor was held down.

The Lessons of the Rochester Fire.

In looking over the ruins of Rochester's recent conflagration and studying the conditions which existed prior to the fire, it is apparent that the principal cause of the great spread of the flames may be assigned to a system of tunnels and wall openings connecting the principal buildings which were destroyed.

It will be recalled that the rapid spread of the Baltimore fire was due in a very large measure to the condition termed the "exposure hazard"—that is, lack of protective measures on the outside of the buildings to prevent the entrance of flames from surrounding buildings. In Rochester this condition was greatly intensified, for the buildings not only lacked protection against flames from without, but were so constructed as to actually furnish means of communication through which the fire spread with greatest ease.

Fig. 1.—In the foreground are shown the ruins of the Beadle-Sherburne Company's store and the Marble Block. The Granite Building is the tall building on the left. The ruined building on the right is Sibley, Lindsay & Curr's Wholesale Building.

The tunnel connecting the buildings extended straight through the center of the burned district, and at one end was located the "Granite Building," the only structure within the burned area containing an iron and steel frame protected by fire proofing.

After the fire this was the only building left standing structurally intact. Twelve stories high, it stood throughout the fire, serving as a great chimney, creating a draft, drawing the flames through the flue-like tunnels, to be finally licked bare itself of all that it contained of an inflammable nature. Aside from this tunnel connection this building was also connected to the adjoining five-story Marble Building, which was not fire proof and was filled with highly combustible materials, by unprotected wall openings connecting each floor of the latter structure with the corresponding floor of the fire proofed Granite Building. On the first story and basement these openings were very large, these floors being practically a continuation from one building to the other.

The fire started in the basement of the Rochester Dry Goods Company's six-story building by the blowing out of the fuse of an electric elevator motor. The location of this building is shown in Fig. 2. The fire spread to the adjoining building of the Beadle-Sherburne Company, then to the Marble Building, and at about the same time the flames leaped across Division street, which is only 33 feet wide between building lines, into the Wholesale Building of the Sibley, Lindsay & Curr Company. These buildings were totally destroyed. The photograph used in Fig. 1 was taken from nearly in front of the Rochester Dry Goods Company's store, where the fire started, and shows the Granite Building standing on the left. On the right will be seen the remains of the Wholesale Building, which extended back almost 330 feet from St. Paul street.

By referring to the map of the burned area, Fig. 2, it will be seen that the Beadle-Sherburne Company's Building and the Marble Building, both of which were of mill construction, were five stories high on the Main street side, one story high in the center and respectively three and five stories high on the Division street side. This opening in the center of these buildings, combined with the one story part of the Granite Building and the large light shaft, formed a magnificent flue for the flames, particularly as the wind was blowing in the direction in which the camera was pointed in taking Fig. 1. Under these conditions alone it is hardly possible that the Granite Building could have escaped unharmed. But the conditions were in reality much worse. The Granite Building and the Marble Building were directly connected on the first floor and basement by wide openings, shown in Fig. 1, which, it is said, were not protected by fire doors. The photograph also shows that connections between the back part of this building were made with the Granite Building on the second, third, fourth and fifth floors. If fire doors were placed in these openings they were of no avail. Of course, after the Marble Building caught, the fire was promptly communicated to the Granite Building.

It was rather early in the fire that the great Wholesale Building across Division street was aflame. This building was of the wall bearing character, with steel floor beams, floor arches of terra cotta hollow tile and stringers supporting this passage are shown in position between the two buildings. On the Granite Building entrance were rolling sheet metal fire shutters, of which only one remained. By reference to Fig. 2 it will be observed that under Division street, from Sibley, Lindsay & Curr Company's stable, a passage extends under the sidewalk, which as it approaches St. Paul street is widened to the entire width of the street. This connects directly with the basement of the Wholesale Building, and by a wide opening to the basement of the Granite Build-

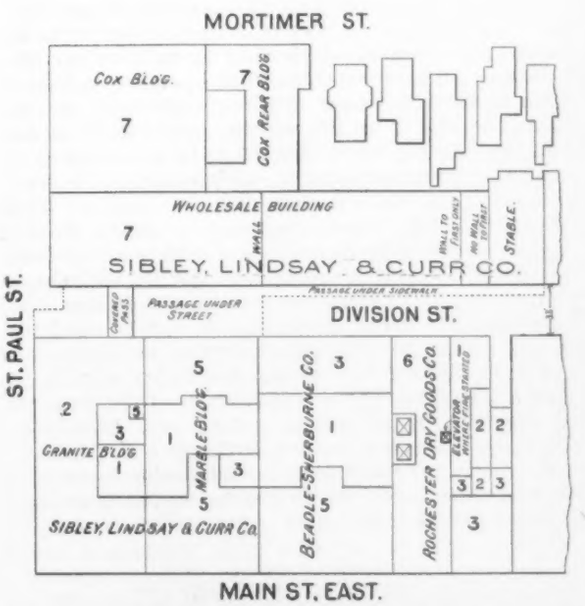


Fig. 2.—Ground Plan of the Fire Area.—The Wholesale Building, and all buildings south of it, were totally destroyed excepting the Granite Building. The buildings on the north were all more or less damaged. The numerals on the buildings indicate their hight in stories.

Fig. 3.—Showing heavy rectangular columns out of place. The way that the terra cotta tiling has cracked is illustrated in the ceiling.

Fig. 4.—View from Granite Building into ruins of Wholesale Building over top of connecting passage.

Fig. 5.—Fire proofing thrown off column by pipe placed within fire proofing.

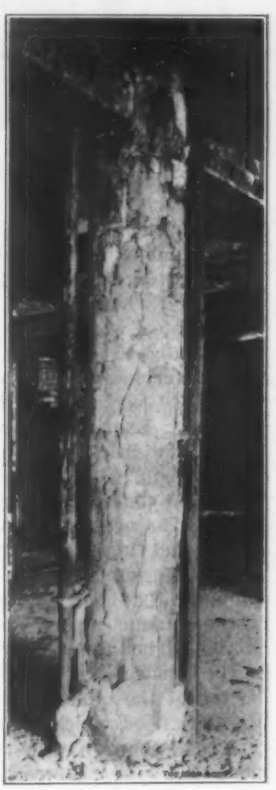


Fig. 6.—Showing another column in which the pipes have been placed outside of fire proofing, which remained in position.

unprotected cast iron columns. The front of this building was built first, after which additions were made from time to time, as indicated by the map, Fig. 2.

The Wholesale Building was connected with the Granite Building on four floors by a covered passageway of corrugated iron, plastered inside over wire lath. The

ing. Some reports say that at this opening in the Granite Building there were iron rolling doors, while others hold that the doors were made of wood covered with tin. At present there are no doors visible, although there are evidences that some kind of doors had been hung there. It is also said that in the excitement the doors stuck and could not be closed.

To illustrate the manner in which these buildings were connected underground, it is told that one could walk from the basement of the Marble Block, through the Granite Building, under Division street, into the Wholesale Building, and through this until under Sibley, Lindsay & Curr Company's stable. To do this one would have to walk nearly 200 yards.

The fire reached the Granite Building by direct connections on two sides from buildings filled with dry goods. It of course shot up the stairway and elevator shafts into the floors above. Had proper precautions been used the building should never have burned.

The 12-story Granite Building was erected about 12 years ago from the plans of J. Foster Warner, at a cost of $600,000. The first four stories are of granite, and those above of Milwaukee brick. The distance from the cornice to the sidewalk is about 163 feet. Cast iron columns protected by terra cotta and steel beams are used throughout. The terra cotta arches are covered with concrete, on which wood floors were laid. The partitions throughout were of hollow terra cotta tile. These are in good condtion, except above the eighth floor, where they have crumbled to a considerable extent. This is particularly true on the east side (the side next to the Marble Building), where the fire was the hottest.

The steel work in the structure is believed to be generally in good condition. Architect J. Foster Farner, when interviewed by a representative of *The Iron Age*, refused to say anything concerning the condition of the building. Examination shows it to be structurally intact. The brick wall on the east side is somewhat cracked, and will have to be repaired promptly. It has been said that it may have to be taken down, but this may not be necessary. A glance at the openings on the second and third floors, as shown in Fig. 1, is interesting. It will be noted that on each side of these are upright columns that are thrown considerably out of place. These columns are of cast iron, and are rectangular in section. They are not used to support the floor beams, as might be suggested by the illustration, but are placed one on top of the other to hold the heavy I-beam girder at the sixth floor, which supports the brick wall above it.

Fig. 3 shows a view of these columns looking out of the opening on the second floor. At the top of the columns can be observed those placed above in a position none too secure. It is also interesting to note the manner in which some of the terra cotta tiles have broken off and the method of protecting the beams in the flat arches.

A photograph taken from the sixth floor of the Granite Building, looking into the Wholesale Building on a line even with the top of the covered passageway between the two buildings, is reproduced in Fig. 4. This shows the small part of that large building as it stands in a ruined condition. The Wholesale Building was a wall bearing structure with unprotected cast iron posts. It is interesting to note the strength of the brick arch which remained standing when so much of the building fell. Attention might also be paid to the twisted arched floor in the center of the picture.

In the basement, where the fire was very hot, may be observed some interesting examples of its effect on the iron work. Fig. 5 shows a cast iron column next to which was placed a pipe. Both of these were covered with the fire proofing. As the covering over the pipe was less thick than over the column, the pipe became the more highly heated, and, expanding, threw the fire proofing away from the column. The pipe then buckled, and is in the position shown in the illustration. The next column to this one is shown in Fig. 6. In this two pipes were placed outside of the fire proofing, which suffered no injury except where chipped by the flames and heat. This is not by any means an unusual case, as examples of this kind may be found without difficulty. Where electric wires have been placed within the fire proofing the terra cotta may be found broken off in somewhat the same manner, but not so badly. Another example of pipes placed inside and outside of the fire proofing is shown in Fig. 7. It will be noted that the pipe on the left was placed next to the column, and that from this the fire proofing has fallen off. On the right, however, the pipe was put outside of the fire proofing, and it has remained intact. This same effect was a very noticeable feature at the Baltimore fire. The effect of the fire on the floors forms an interesting feature. In the first floor, which is formed by curved terra cotta arches of not too great width, covered with concrete, the middle of most of the 20-foot beams has sprung upward. This buckling is shown in Fig. 7, which is not an exaggerated example. A high authority on building construction estimates that the rise in the center of the beams is from 1½ to 2 inches. In a very few cases the beams appear to have slightly sagged.

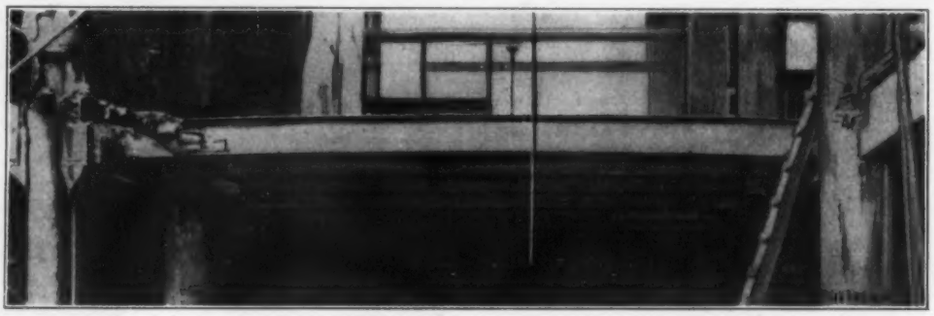


Fig. 7.—Showing the upward warping of the beams in the first floor of the Granite Building.

The lower flanges of the beams on this floor were not covered with fire proofing, but were simply plastered over. Water being thrown against the bottom of the heated beams, doubtless caused the upward warping.

This effect is not shown on any of the upper floors, on all of which the flat arch has been used, the bottoms of the beams being protected by terra cotta soffits, as shown in Fig. 3.

As is the usual experience, the brick work withstood the effects of the fire much better than did the granite and sandstone used. Marble was in many instances reduced to lime and crumbled by the heat.

An electrical engineer, who has made a particular study of building conditions, in speaking of the origin of the fire, stated that in his judgment no electric elevator should be permitted to be placed at the bottom of an open elevator shaft. He believes that they are apt to cause fire, and should in every case be carefully inclosed in a fire proof compartment.

A conservative estimate places the cost of putting the Granite Building into good condition and ready for occupancy at $200,000, about one-third of the original cost of the building.

The Baush Machine Tool Company.—The Baush Machine Tool Company of Springfield, Mass., have been reorganized, Wiliam H. Baush, the president and treasurer of the company, retiring from business. Henry R. Dalton, Jr., of Springfield, of the Chapman Steam Valve Company, is the new president, and C. J. Wetsel

is the treasurer and general manager. It is the purpose of the new management to continue the present lines, which include boring mills, multiple spindle drills and radial drills, and to push the business generally. Mr. Wetsel, the new manager, was until recently in a similar position with the Spaulding Mfg. Company of Chicopee Falls, Mass. George H. Baush will continue as the general superintendent of the plant. David Hunt, Jr., until recently secretary of the company, has become the general sales manager for the Warner & Swasey Company of Cleveland, Ohio.

The Production of Pig Iron by Grades.

The American Iron and Steel Association has issued interesting statistics showing the production of pig iron by grades in 1903 compared with 1902. In these figures a few thousand tons of castings direct from the furnace are included in the totals for white and mottled and miscellaneous grades of pig iron for each year. High silicon pig iron is included in the foundry figures.

The Bessemer figures include low phosphorus pig iron—that is, iron running below 0.04 per cent. in phosphorus. Iron containing from 0.04 to 0.10 per cent. of phosphorus is classified as Bessemer. The basic figures are confined strictly to pig iron made with mineral fuel, and do not include the small quantity of basic iron that is annually made with charcoal, practically all of which is used by manufacturers of steel castings.

The following table gives by grades the total production of pig iron in the United States in 1902 and 1903, in gross tons of 2240 pounds:

Grades.—Gross tons.	1902.	1903.
Bessemer and low phosphorus pig iron	10,393,168	9,989,908
Basic pig iron made with mineral fuel	2,038,590	2,040,726
Forge pig iron	833,093	783,016
Foundry and high silicon pig iron	3,851,276	4,409,023
Malleable Bessemer pig iron	311,458	473,781
White and mottled and other grades	180,741	120,137
Spiegeleisen	168,408	156,700
Ferromanganese	44,573	35,961
Totals	17,821,307	18,009,252

Of the total production of pig iron in 1903 over 55.4 per cent. was Bessemer and low phosphorus, as compared with over 58 per cent. in 1902; 24.4 per cent. was foundry, against 21.6 per cent. in 1902; over 11 per cent. was basic, against about 11 per cent. in 1902; 4.3 per cent. was forge, against 4.6 per cent. in 1902; over 1 per cent. was spiegeleisen and ferromanganese, against 1.19 per cent. in 1902, and 2.6 per cent. was malleable Bessemer, against 1.7 per cent. in 1902. The production of white and mottled and miscellaneous grades of pig iron and of castings made direct from the furnace amounted to a little over 1 per cent. in 1902 and to less than 1 per cent. in 1903.

In 1903 the production of low phosphorus pig iron, which is chiefly used by manufacturers of acid open hearth steel, amounted to 200,422 tons, against 164,246 tons in 1902. In 1903 it was made by four States—namely, New York, Pennsylvania, Tennessee and Ohio. In 1902 all the States named made low phosphorus iron except Ohio. New Jersey, which made low phosphorus iron in 1902, did not report any for 1903.

The following table gives the production by States of Bessemer and low phosphorus and basic pig iron in 1902 and 1903. The small quantity of charcoal basic pig iron is not included:

	Bessemer and low phosphorus.		Basic.	
States.—Gross tons.	1902.	1903.	1902.	1903.
New York	60,818	129,323	15,766	34,516
New Jersey	5,868	.....	74,970	83,286
Pennsylvania	5,130,022	5,213,143	1,528,748	1,417,253
Maryland	296,971	321,784	.....	.....
Virginia	.....	1,000	95,776	90,543
West Virginia	182,937	198,688	.....	.....
Tennessee	9,746	26,856	.....	5,176
Alabama	.....	2,299	199,415	172,280
Ohio	2,927,605	2,422,676	101,457	190,840
Illinois	1,495,298	1,386,683	.....	.....
Michigan	926	3,520	.....	.....
Wisconsin	70,303	74,080	.....	.....
Minnesota	11,099	33,740	.....	.....
Missouri	.....	.....	22,458	17,000
Colorado	201,580	176,116	.....	29,832
Totals	10,393,168	9,989,908	2,038,590	2,040,726

The production of foundry and forge pig iron by States in 1902 and 1903 was as follows:

	Foundry.		Forge.	
States.—Gross tons.	1902.	1903.	1902.	1903.
Massachusetts	3,360	3,265	.....	.....
Connecticut	12,086	14,501	.....	.....
New York	272,633	304,667	45,887	37,986
New Jersey	59,015	85,257	32,234	25,750
Pennsylvania	845,472	948,957	399,962	433,925
Maryland	3,789	2,460	1,939	326
Virginia	348,771	413,403	59,402	29,551
West Virginia	68	43	.....	.....
Kentucky	93,699	98,600	15,381	2,453
Tennessee	328,975	350,966	41,137	23,159
North Carolina	544	6,779	71	619
Georgia	30,762	59,910	.....	5,765
Texas	3,095	11,408	.....	.....
Alabama	1,044,874	1,194,556	170,784	155,937
Ohio	403,880	416,850	52,418	61,904
Illinois	67,627	115,223	2,649	5,641
Michigan	154,234	239,369	.....	.....
Wisconsin	152,965	112,656	.....	.....
Missouri, Colorado and Washington	25,427	30,153	11,229	.....
Totals	3,851,276	4,409,023	833,093	783,016

Included in the 4,409,023 tons of foundry iron made in 1903 are 51,516 tons of ferrosilicon, produced in Virginia, West Virginia, Kentucky, Tennessee, Georgia and Ohio, a small part of which was made with electricity. For 1902 ferrosilicon was not separately collected. Pig iron containing 7 per cent. of silicon and over is classified as ferrosilicon.

The production of malleable Bessemer and of white and mottled and miscellaneous grades of pig iron in 1902 and 1903 is given in the following table. Castings made direct from the furnace are included with white and mottled iron:

	Malleable Bessemer.		White and mottled and miscellaneous.	
States.—Gross tons.	1902.	1903.	1902.	1903.
New York	....	44,951	6,265	1,474
New Jersey	2,748	.....	2,368	2,028
Pennsylvania	7,693	41,790	62,067	45,068
Maryland	....	.....	530	.....
Virginia	500	.....	32,767	9,537
West Virginia	....	.....	.....	282
Kentucky	....	.....	1,645	1,388
Tennessee	....	.....	12,920	12,211
North Carolina	....	.....	15	126
Georgia	....	.....	923	2,403
Texas	....	.....	.....	245
Alabama	....	.....	56,543	35,212
Ohio	144,629	188,173	1,399	6,991
Illinois	118,805	126,873	40	.....
Michigan	....	.....	53	1,820
Wisconsin	37,083	61,688	2,537	1,352
Missouri and Washington	....	10,306	669	.....
Totals	311,458	473,781	180,741	120,137

The production by States in 1902 and 1903 of spiegeleisen and ferromanganese was as follows, making the dividing line 40 per cent. of manganese:

	Spiegeleisen.		Ferromanganese.	
States.—Gross tons.	1902.	1903.	1902.	1903.
New Jersey	14,182	15,346	.....	.....
Pennsylvania	99,383	76,493	44,453	34,871
Alabama	475	24	120	1,090
Illinois	45,801	57,955	.....	.....
Colorado	8,567	6,882	.....	.....
Totals	168,408	156,700	44,573	35,961

The figures given for ferromanganese for 1902 include a small quantity of ferrophosphorus made in one of the Southern States. Ferrophosphorus was not reported for 1903.

Workmen Supporting the Shipping Bills.—A petition relating to the various shipping bills pending in Congress has been sent to every Senator and Representative by John McNeil, the Grand President-Organizer of the Brotherhood of Boiler Makers and Iron Shipbuilders of America, whose headquarters are at Kansas City, Kan. The petition urges the passage of Senate bill 2259 and House bill 12,222, "To regulate shipping in the trade between the ports of the United States and ports or places in the Philippine Islands;" Senate bill 2263 and House bill 1639, "for the carriage of Government war and naval stores in American vessels," and House bill 7056, "creating a commission to consider and recommend legislation for the development of American merchant marine."

This petition states that it is written in the name of 24,000 American workmen, members of the above-mentioned organization, with 500 lodges in as many different parts of the United States. It states that American shipbuilders cannot build ships as cheaply in the United States as foreign ships are built, largely because the wages which American workmen receive are far higher than obtain in foreign shipyards and boiler shops. The members of the union stand for the American standard of wages and of living, and are better citizens because they enjoy them. They state that they are not interested in trusts, combinations or monopolies, and have neither political nor partisan interest in these bills, but want them passed because they mean work for the Brotherhood members at their trade.

A Standard Pocket Test Gauge.

To meet the demand for a neat and light yet accurate test gauge of a suitable size and construction, so that it could be carried in the pocket or handbag without injury, the Ashton Valve Company of Boston, Mass., have brought out the instrument shown herewith. It is made with a bevel plate glass front and fitted with a cover to insure perfect protection. In this shape it is particularly adapted to the use of air brake inspectors, boiler inspectors, master mechanics and chief engineers.

Like the other standard gauges of the same make, it is provided with a spring of solid drawn seamless tubing

POCKET TEST GAUGE WITH COVER REMOVED.

and a non-corrosive movement. In the 3-inch size it is graduated for any pressure up to and including 500 pounds. It is finished in nickel plate, and weighs complete with cover about 1 pound.

Brown & Sharpe Against the Metric System.

WASHINGTON, D. C., March 15, 1904.—The House Committee on Coinage, Weights and Measures on the 10th instant gave a hearing upon a bill providing for the adoption of the metric system to L. D. Burlingame, of the Brown & Sharpe Mfg. Company, Providence, R. I., who opposed the measure on the ground that it would cause great confusion in the machinery trade, by introducing a double standard, and would materially increase the cost of operating machine shops and other manufacturing plants because it would necessitate duplicate parts of machines as well as maintaining complete sets of measuring instruments graduated to both English and metric systems. Mr. Burlingame also appeared as the representative of the Providence Association of Mechanical Engineers, which has a membership of upwards of 150, who are representative of the machinery interests of the State.

Referring to the units of the metric system, Mr. Burlingame said that there was none so convenient for machinery manufacturers as the inch. The millimeter was so small a unit that its value must be expressed for practical work in large figures; for example, 30 inches would become 760 odd millimeters. In the matter of figuring drawings, it was his experience that the English system was quite as simple as the metric and involved fewer figures. Referring to the statements made by advocates of the metric system, that it was much simpler for purposes of calculation, Mr. Burlingame said he had made an effort for several months, not only with the aid of his own men, but with the assistance of the members of the Mechanical Engineers' Association, to find a problem in their line of work in which there would be a saving of time, but he had failed to find a single instance, although the draftsmen of his company included many foreigners who were brought up on the metric system.

W. L. C.

The Cambria Steel Company's Annual Report.

The annual report of the Cambria Steel Company makes the following showing for the year ending December 31, 1903:

Net earnings from operations		$3,048,755.12
To which add incidental receipts for rents from tenants, income from investments and interest on bank accounts		424,124.76
Total		$3,472,879.88
Deduct fixed charges under Cambria Iron Company lease, interest on term notes and incidentals		464,613.56
Net income 12 months		$3,008,266.32
Total to credit income account, December 31, 1903		$3,008,266.32
Which has been appropriated as follows:		
Dividend No. 4, paid August 15, 1903	$675,000	
Dividend No. 5, paid February 15, 1904	675,000	$1,350,000.00
Set aside to general depreciation fund	400,000.00	
Set aside for betterment and improvement fund	500,000.00	2,250,000.00
Balance carried to credit of profit and loss account.		$758,266.32
The profit and loss account, which had a credit December 31, 1902, of		$1,482,322.30
Has been increased by balance of income account transferred as above		758,266.32
Total		$2,240,588.62
And reduced by bad or doubtful accounts	$43,546.91	
Less accounts collected charged off in previous years	4,271.18	39,275.73
Leaving balance to credit of profit and loss account December 31, 1903		$2,201,312.89

Assets.

Property, works, coal, ore lands, &c., subject to payment of $338,720 annual rental, under Cambria Iron Company lease for 999 years, being 4 per cent. on $8,468,000, Cambria Iron Company's stock		$33,090,304.68
Plant additions		4,510,590.18
Total		$37,600,894.86
Real estate, titles in Cambria Steel Company		72,042.18
Sundry securities		1,132,132.00
Inventory account:		
Materials, supplies and products.	$5,919,278.13	
Equipment	591,774.85	6,511,052.98
Special deposit	$3,750,000.00	
Cash	344,544.83	4,094,544.83
Accounts receivable		3,799,662.40
Bills receivable		393,598.49
Total		$53,603,927.74

Liabilities.

Capital stock issued	$45,000,000.00
General depreciation fund	1,200,000.00
Betterment and improvement fund	2,000,000.00
Accounts payable, including dividend No. 5, $675,000	1,927,614.85
Bills payable—term notes*	1,275,000.00
Profit and loss account	2,201,312.89
Total	$53,603,927.74

* Of the $3,500,000 term notes issued December 15, 1900, $2,225,000 have been paid, including $680,000 in 1903, leaving $1,275,000 outstanding, $665,000 of which are due and payable in 1904, $45,000 in 1905 and $565,000 in 1906.

The report states that further purchase was made of 838 shares of stock of the Republic Iron Company of Michigan, making 39,766 out of a total of 40,000 shares. This company had a large cash reserve not required in the conduct of their business, and in accordance with

action taken at a shareholders' meeting, held March 17, 1903, their capital stock was reduced on April 28, 1903, from 60,000 shares, $1,500,000, to the present capital of 40,000 shares, $1,000,000. The Cambria Steel Company surrendered 19,413 shares, representing their pro rata of the reduction made in the stock capital, and received in exchange therefor a cash payment of $485,325.

The coal, iron ore and limestone properties owned produced satisfactory results. The Penn Iron Mining Company shipped from their mines on the Menominee Range, Mich., 340,109 tons of iron ore for use at the Cambria works. The Republic Iron Company shipped from their mines in the Marquette district, Mich., 153,857 tons of iron ore, about 140,000 tons of which the Cambria Steel Company will use. The Mahoning Ore & Steel Company, Mesaba district, Minn., produced, on account of Cambria's half interest, 500,000 tons of iron ore in 1903.

The work that has been carried on at the Franklin plant during the year has been in the direction of the completion of the plant in accordance with the plans contemplated when originally designed. Ten 50-ton furnaces have been operated; five more are under construction, work upon which was suspended in November, due to the unfavorable business conditions. As soon as orders for open hearth products warrant these five furnaces can be completed in a short time. Two additional plate slab heating furnaces were authorized and were about two-thirds completed when work was temporarily suspended. The construction of No. 7 blast furnace at Franklin was authorized in April, 1903. Work was commenced May 1 and pushed actively for about five months, when the business conditions had so changed that the furnaces in operation were ample to supply the metal required, and no further work has since been done on this improvement, except such as was necessary to protect it. The work is in such forward condition that the furnace can be promptly completed when needed. Work on 100 additional Otto-Hoffman ovens commenced in the latter part of 1902, but was seriously delayed during the first half of 1903 by scarcity of skilled labor and by weather conditions. It is now expected to have these ovens in operation about May, 1904.

The car plant has been operated successfully during 1903. The product was considerably reduced by the difficulties in securing deliveries of outside specialties in time and quantity to enable the plant to be operated continuously.

The physical condition of the plant has been fully maintained by current repairs and additions. There was expended for improvements $2,444,932.32; of this amount $2,364,593.14 was charged to plant additions, and the remainder, $80,339.18, was repaid by amount realized from sales in 1903 of real estate and minerals under terms of the lease from the Cambria Iron Company. There was expended $375,201.57 for replacements and alterations and charged to operating accounts. The work on authorized improvements, with exceptions before referred to, has been continued.

The Manufacturers' Water Company, of which the Cambria Steel Company control the entire capital stock, provide the water supply for the works, averaging 53,000,000 gallons daily. Construction on the Hinckson's Run reservoir, commenced in 1902, was proceeded with during 1903 and $82,343 expended thereon. It is expected that it will be completed during the coming season. The Conemaugh pipe line is now substantially completed and will be in use early in the spring of 1904. The amount expended to December 31 was $172,625. Work on the Quemahoning reservoir and pipe line has been confined to engineering. Some property has been purchased for a site for reservoir. The expenditure was $25,741. About $100,000 will be required to meet the expenditures of the Manufacturers' Water Company during 1904.

The shipments of steel show an increase per month, compared with the preceding year, of 2 4-10 per cent. in quantity and in the gross value of all products shipped 5 1-10 per cent. The output in the early months of the year continued to be very seriously curtailed and its cost increased by the inadequate transportation facilities furnished by railroads connecting with the works. For the first seven months of the year the works were under severe pressure to fill orders, but since August, 1903, although there were ample orders on the books, it was impossible to secure specifications and shipping directions, and the output was reduced from 25 to 50 per cent.

Allis-Chalmers Expansion.

Confirming the extensive enlargement of manufacturing facilities by the Allis-Chalmers Company, Chicago, reported in these columns last week, comes the official announcement that they have entered into an agreement with the Bullock Electric Mfg. Company, Cincinnati, Ohio, whereby the business of the two companies will be carried on hereafter as that of a single interest. Under the terms of agreement the business of the Bullock Company is to be conducted by a new Bullock Electric Mfg. Company, organized under the laws of Ohio, with common and 6 per cent. preferred stock, the dividend on the latter being guaranteed by the Allis-Chalmers Company. The new company are to continue under the same management as at present, including George Bullock, president, and Joseph S. Neave, vice-president.

The acquisition of the Bullock works, which are located in East Norwood, Ohio, places the Allis-Chalmers Company among the largest manufacturers of electrical apparatus in America. The plant surpasses in size and productive capacity any similar works in this country, exclusive of those of the General Electric and Westinghouse companies, and was constructed with the view of manufacturing not only the smallest but the largest electrical machinery ever built. It is said that it has a capacity for larger electrical machines than can be made in any other factory in the world. Extensive additions to the shops are now being constructed, and it is their intention to erect another large building which will contain about 40,000 square feet of floor space.

The Bullock Company have recently purchased the plant of the James Cooper Mfg. Company, Montreal, Canada, which was one of the largest and best equipped electrical manufacturing establishments in Canada. This plant will be devoted to the products of the combined industries in the Dominion, and will be operated under the name of the Canadian Bullock Electric Mfg. Company, Limited.

With the broad and comprehensive line of engines and machinery of the Allis-Chalmers Company, the steam turbines, Escher-Wyss hydraulic machinery and Nurnberg gas engines, American rights for which they recently acquired, and the full line of electrical apparatus of the Bullock Electric Mfg. Company, the combination of interests will enable either company to bid on complete power plants, whether driven by steam, water or gas, and supply not only the prime movers, but the complete electrical apparatus from generators to motor, for either factory, car or interurban work as well as large electrical locomotives.

The consolidation will have an aggregate capital of $39,850,000, and will control two large plants in Milwaukee, Wis., two in Chicago, one in Scranton, Pa., one in East Norwood, Ohio, and one in Montreal.

The Carpenter Steel Company, Reading, Pa., deny the reports that the company, because of their recent embarrassment, are no longer active in the steel business. The works of the Carpenter Steel Company are being run by Robert E. Jennings as receiver, who states that the trade, considering the dullness of the times, was never better. The works are constantly making and are carrying in stock a full assortment of Zenith, air hardening and other special steels from which they can supply all orders promptly.

The Boston Labor Bureau has received more than 1000 applications for employment since it was started three months ago, and has placed more than 100 men in positions, especially during the past fortnight, showing that the demand for workmen is increasing.

The Iron Age

New York, Thursday, March 17, 1904.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.

The Northern Securities Decision.

The Supreme Court decision in the Northern Securities case is precisely in line with what had really been expected ever since the finding of the Circuit Court. Those who claimed to be looking for a reversal were simply hoping that such would be the result. The position taken by the trial judges was so pronounced that it would have been surprising if they had been proclaimed mistaken in their interpretation of the law by the Supreme Court. Although the decision was made by a bare majority of the nine judges, it is as binding as if the court had been unanimous. The decision coincides with the general opinion of those who are thoroughly disinterested, that the Sherman act was intended to prevent just such a combination of parties engaged in serving the public. It is some time since the act has been seriously invoked to prevent such projects, and the slumbering of justice has been taken to mean that the statute was dead. Now that its provisions have been brought into action it has been found applicable to the purpose for which it was designed and apparently strong enough to meet the requirements of the situation. In pronouncing the decision of the court, Justice Harlan says: "The time has come when the people need to be protected from the encroachment of great combinations of corporate interests if the Government is to remain a Government of the people." This is not only strong language, but it is ominous as to its application in case other suits should be brought. The question comes up whether other great corporations will be permitted to rest, or the law be enforced to its full intent.

In view of the important interests involved it seems to be desirable that some analysis be made of the present situation. A disposition is observed to jump to conclusions. The language of Justice Harlan is being taken to signify that attacks which may be made on large industrial corporations will receive equally drastic treatment should suits against them be brought before the Supreme Court. In the daily press such expressions as these are found: "This decision strikes at the root of industrial combinations." If judicial action is thus correctly foreshadowed, it would mean serious consequences for holders of securities of industrial corporations. We are inclined, however, to believe that the condition of these corporations is not so precarious as to justify this view. Attorney-General Knox is quoted as asserting that the Government does not mean to run amuck, which is taken to mean that it is not the intention of the Administration to embark upon a campaign against all corporations which may appear to have been organized for purposes interdicted by the Sherman act. Nevertheless, it would still be possible for individuals who feel that something should be done to institute actions in the interest of the public welfare. If this should be done, would such actions be likely to be successful? Let us see. This decision has been made by a bare majority of the court. Justice Brewer, who voted with the majority, is evidently not in perfect accord with the opinion expressed by Justice Harlan, for he states that in some respects the opinions in trust decisions have gone too far. It would appear, therefore, that at least one member of the majority is in a frame of mind which would lead him to oppose further action by the Supreme Court if he believed it would be attended with serious consequences and disturb great business interests. The dissenting judges include among their number three whose past political affiliations would appear to have arrayed them against the Northern Securities Company, two of them in fact having reversed the position they occupied when the Trans-Missouri question came up for adjudication. When these three judges feel warranted in taking their present position in such a case as that of the legality of the Northern Securities Company it may be pretty safely assumed that they will not be in favor of attacking the legality of other corporations whose standing is not nearly so questionable. The opinions of some of the dissenting judges were fully as strong in support of their position as that of the majority. Justice Holmes stated that he was "happy to know that only a majority of his brethren adopt an interpretation of the law which," in his opinion, "would disintegrate society as far as it could into individual atoms." Justice White declared that "the action as stated by the majority of the court involves principles of destruction of government, human liberty and every principle upon which organized society depends."

It would not be strange, in view of the situation as above analyzed, if it should be found that the decision in the Northern Securities case is the last great legal victory won by the opponents of so-called trusts. We have seen in the past few years a strong tendency toward more liberal construction of the laws against combinations and consolidations. More than one State formerly noted for its hostility to great corporations has changed its attitude and invited such corporations to make the Commonwealth their home. The liberalization of the Supreme Court also seems to be in progress, as shown by the attitude of the various judges. The trusts are evidently in less danger now than they were before the promulgation of this decision. They may, indeed, be permitted to work out their destiny. Their managers have learned much within the past few years, and are undoubtedly far wiser than when they first began to conduct business under the modern system of dealing with great affairs of production and distribution. The weaknesses of consolidations have been shown, and their power is seen to be far less than had been feared. It is no longer a problem as to whether they will destroy all competition. The main question is whether they can be so managed as to continue to pay fair dividends to their stockholders.

Practical Effects of the Eight-Hour System.

Some recent developments are illuminating the eight-hour question. The labor leaders who are agitating in favor of measures which will bring about a general eight-hour day claim that it is the universal desire of workingmen. But they sometimes change their minds. The difficulties which surround this matter are illustrated, for instance, in the case of contracts for ferry boats which are about to be placed by the authorities of New York City. The city has purchased the ferry line running between New York and Staten Island. Contracts will shortly be placed for five boats of high speed and superior accommodations for this service. Under existing law all work on New York municipal contracts is limited to eight hours per day. The workingmen of New York are anxious to have these contracts awarded to shipbuilders who have plants inside the city limits. But it also happens that another law compels the city authori-

ties to award contracts to the lowest bidder. It is expected that shipbuilders in other States will compete for a contract of this kind, and in those States the men are not limited to eight hours, but are employed the usual ten hours. To overcome this handicap on the shipbuilders of New York a bill, backed by union influence, has been introduced in the State Legislature making an exception in this particular case, permitting the work on these boats to be done at the ten-hour rate. Another instance which comes under the public notice is that of a large Eastern railroad company, whose union workers have recently been clamoring for an eight-hour day. They have found, however, that an eight-hour day will mean reduced wages, and this has caused them to make a speedy change of front. They now feel convinced that they can work nine hours a day just as well as not, and are protesting against the enforcement of an eight-hour schedule. These are purely home affairs and have no connection with international business. Whenever foreign competition is encountered the employer who operates on the eight-hour system is badly handicapped. When workingmen find that the eight-hour day means lower daily earnings, and possibly a reduced amount of employment, the agitation for the shorter day will come to an end.

The Plant Expenditures of the United States Steel Corporation.

The elaborate annual report of the United States Steel Corporation, from which we print liberal extracts elsewhere, is one of the most important documents which reach the iron trade. The financial results have been pretty thoroughly anticipated by the frequent reports of earnings and by the action of the directors in stopping the payment of dividends on the common stock. To iron manufacturers the most interesting part of the report is that which deals with the question of the maintenance and improvement of plants. It was largely for the purpose of financing these that the unfortunate conversion of preferred stock into bonds was undertaken.

The report contains full data on this important subject. It will be readily understood that when the different great properties were welded into one the plants were far from being on the same level of efficiency. A comprehensive system of studying the weak points was followed by a very extensive remodeling, and in some instances by the building of entirely new works. As expected, too, the technical management took in hand, on a large scale, what may be termed experimental work, which individual enterprises could not have so readily undertaken. As instances we may cite the Bray system of rolling at Monessen and the Gayley dry blast at Isabella furnaces.

That great progress has been made in the reduction of costs there can be little doubt to any one who has had the opportunity to become familiar with the work, but we doubt whether many have appreciated what expenditures this has involved.

The report submits figures in three groups, the first dealing with the outlays for ordinary maintenance and repairs, which were charged to current operations. For the year 1903 the total for these figures up $21,845,413.38, as compared with $21,230,218.13 in 1902, the amount spent on manufacturing properties alone being $16,046,275 in 1903. The second group includes outlays for extraordinary replacements and improvements, which totaled $12,939,777.83 in 1903, against $7,926,792.60 in 1902. These were met from funds set aside during 1902 and 1903 from earnings. Finally, there were expended during 1903 for construction and for additional property $22,620,946.93, which was charged to capital account. During 1903, therefore, there were expended on repairs, renewals and additional property the total sum of $57,406,138.14. The report goes into a good deal of detail concerning the amounts expended for improvements and extraordinary repairs, and for construction and additional property. We tabulate below the items for the principal manufacturing properties:

	Construction and additional property.	Improvements and extraordinary repairs.
Carnegie Steel Company	$3,745,950.99	$3,549,192.94
Illinois Steel Company	2,072,727.04	2,149,208.59
Lorain Steel Company	2,339,655.63	148,188.63
American Steel & Wire Company	1,142,673.71	2,474,155.98
National Tube Company	1,395,766.38	628,331.81
American Tin Plate Company	709,914.31	213,050.90
American Sheet Steel Company	124,557.13	866,196.18
American Bridge Company	2,099,169.60	133,334.56
All iron mining companies	1,040,525.68	212,019.53
All coal and coke companies	2,780,520.00	194,131.56

The largest single addition to plant in which the United States Steel Corporation are engaged is, of course, the new furnace plant and pipe mill at Lorain, the greater part of the undertakings at the works of the other constituent companies having been brought to a conclusion last year. With the Union-Sharon purchase adding considerably to capacity in certain lines, it is fair to assume that for some time to come no very large new additions will be considered. Yet the data submitted show how large an annual sum is needed for maintenance and for improvements. There have been a number of conspicuous examples during recent years of the necessity for the expenditure of huge sums to modernize and to bring up to normal efficiency iron and steel plants whose managers had allowed them to run down. The Steel Corporation will be forced, and fortunately their managers have shown the disposition, to draw heavily upon earnings to keep the manufacturing end up to date.

CORRESPONDENCE.

Patent Office Management.

To the Editor: The recent articles on patents and patent office affairs, in *The Iron Age*, afford ample evidence of the fact that there are always critics; and while I have little sympathy for our California friend who, as a builder of war vessels, failed to patent his invention, one may offer a word of consolation to the Middle West inventor who attempted to improve hydraulic machinery.

Your correspondent "E. B. S." in the issue of February 11 in his—as it seems to me—somewhat overzealous defense of the patent office, says, "Every action of the primary examiner bears his signature and is a part of the record." After a personal experience of about thirty-five years as a correspondent of the patent office, I am unable to recall one instance where a communication from an examiner contains any information leading to his personal identity. The letters always purport to come from the commissioner, who alleges they are "from the examiner in charge of the case," and are never signed by the examiner. There seems to be no responsibility connected with them, except such as the commissioner—who probably never sees them—may assume; and one may carry on a correspondence for an indefinite period and never actually know whom one is writing to. To be sure, one may consult the directory and find out who is the "examiner in charge," as indicated by the number of the room shown on the letter, but it has always been a question in my mind whether the majority of such letters were written or dictated by "the examiner in charge," his errand boy, or by some other of his various assistants. There is a total lack of responsibility about these letters, and, perhaps for this reason, too often of common sense and dignity as well. This lack of responsibility seems to me to be a radical defect in the entire system of the patent office practice; nothing could be devised to more ingenious-

ly evade it, but as the entire system of the office seems to be operated chiefly for the benefit of those who find remunerative employment there, we can scarcely hope for any change.

It requires a good deal of humility, and temerity as well, for one to attempt to prosecute one's own application for a patent—indeed, one had better give up before one starts, and thus save one's self much trouble and expense.

It ought to be as easy to obtain a patent—if one is entitled to it—as it is to get a letter out of the post office; yet the average person in the community, without previous experience, would no more be able to prosecute to success an application for a patent than he would an application for a commission in the King's bodyguard.

The state of affairs is simply outrageous, and is possibly aggravated by the hungry horde of patent solicitors, for whose existence, as already intimated, there should be no positive cause.

The correspondent referred to further says: "And while some of the examiners seem to think their duties are to prevent the issue of lawful patents, it is only a minority of the primary examiners who are known as obstructionists."

It has been many years since this writer has come into communication with a patent office examiner, either real or alleged, who did not properly come under the "obstructionists" classification.

Even the commissioner himself, previous to the present incumbent, recommended an extra fee of $5 for interlocutory appeals, notwithstanding several millions of dollars of surplus fees are already credited to the patent office fund.

More than twenty-five years ago this writer told a patent office examiner that the ingenuity of these "obstructionists" in the office vastly exceeded the ingenuity of the inventors outside, and it has been getting more so ever since.

An applicant for a patent is treated as though the "right" belonged wholly with the official, to be granted only as a special favor, and to be so regarded, and even then, under aspects the most favorable to the applicant, it is only granted after every known official resource against it is exhausted.

This treatment does not usually inspire the average inventor with an exalted opinion as to the value of his right to appeal, and as the matter of appeal costs the applicant good money, he too frequently allows the matter to drop, and thus we have upward of 40 per cent. of the applications die before they are born, which always seemed to the writer as though regarded by the officials as an achievement of an extra commendable character.

A recent letter illustrates the methods. After saying "the claims are rejected on the following" (quoting one or two patents), it says, "a duplication of the lever A of the Smith would not amount to invention." This letter is regarded as impertinent, insulting, frivulous and trifling, and totally devoid of common sense, not to say courtesy. The Smith patent referred to contained no lever A, hence there could be no such duplication as was intimated. Thus the charge was an insult and without sense; impertinent—because it attempts to instruct the applicant upon a matter upon which he may fairly be supposed to require no instruction—and is further insulting because it assumes that the applicant does not know what constitutes invention. Besides it attempts to give applicant negative and worthless information, when he has paid his money for positive and useful information.

And yet this is the work, and not unusual work, of one of the great bureaus of our country, and often quoted at home and abroad as a model affair.

The above case is by no means an exceptional one. In another case, not long ago, in my experience the examiner quoted something that existed only in his fertile imagination. And after calling his attention to it, he declared, and repeated it, that he was right. It was only after I appealed to the commissioner that the examiner practically acknowledged that he had misled me by saying in his response to my appeal that "he did not think such a little mistake would amount to anything;" thus, indicating that "mistakes" or lapses of truth in the patent office are graded according to a system regulated by the imaginative capacity of their perpetrators.

On several occasions I have been compelled to send duplicate fees for copies of patents ordered. No business man could ever hope to retain the patronage of his customers if they were used according to the patent office standard. I have received in a *registered* letter a check or draft for 5 cents (overpaid fees), at the same time paying double fees of a dollar, more or less, for copies of patents alleged to have been sent—according to their custom—as ordinary mail matter, but which probably never left the patent office.

One might go on indefinitely in this manner, but, admonished that my space is probably exhausted, I close with a prayer for more light upon the devious and ocult ways of patent office practice, which are beyond the ken of any expert. G. C. P.

BOSTON, MASS., March 14, 1904.

A Consolidation of Two Mill Supply Houses.

Papers of incorporation were filed on Friday, the 11th inst., by the Walter A. Zelnicker Supply Company of Alabama for the purpose of transacting a mill, railway and factory supply business.

The capital stock of the new company is $90,000, fully paid in.

The officers of the new company are as follows: Walter A. Zelnicker, president; Wilson Ashley, vice-president; Jas. H. Zelnicker, secretary and treasurer.

The incorporators are the three above named gentlemen, Mrs. Ella W. Stanton and Boykin B. Boone.

The new company will absorb the business now conducted as the Mobile Branch of the Walter A. Zelnicker Supply Company of St. Louis and the business of Chas. W. Stanton & Co.

The stock of the Walter A. Zelnicker Supply Company will, within the next few days, be removed from its present location, St. Louis and Commerce streets, to the store now occupied by Charles W. Stanton & Co., 13 and 15 South Commerce street.

The new firm will be under the active management of Jas. H. Zelnicker and Wilson Ashley, both of whom have been closely identified with the mill supply business in Mobile for the past ten years.

PERSONAL.

Andrew Carnegie sails on the 19th instant, going first to Aix-les-Bains, France. Later he will spend some time in London and then proceed to Skibo Castle, Scotland.

William H. Morse, engineer for the Power & Mining Machinery Company of New York, is about to make a trip to New Zealand in the interest of the company.

B. H. Warren, formerly second vice-president of the Westinghouse Electric & Mfg. Company, has been elected president of the Allis-Chalmers Company, to succeed Charles Allis, who recently resigned on account of the ill health of his wife. Mr. Warren graduated from the Naval Academy at Annapolis and served in the navy until 1878. Since then he has been engaged in practice as a mechanical and electrical engineer.

George J. Bancroft, Jr., has been placed in charge of the mining interests of the Engineering Company of America, with headquarters in Denver, Col.

A. P. Cox, for some years with the sales department of the American Steel & Wire Company, has resigned his position in that company, and is now connected with the advertising and mail order department of Manning, Maxwell & Moore, New York.

Richard C. Drinker, formerly connected with the Bethlehem Steel Company, has been engaged by the Fore River Ship & Engine Company, Quincy, Mass., as forge engineer in charge of the manufacture of marine forgings.

Charles Hyde of Hyde Brothers & Co., Pittsburgh, and president of the Clearfield Steel & Iron Company, Clearfield, Pa., sailed for England on business on Wednesday, March 16.

William E. Reis, long prominently connected with the iron industry of the Shenango Valley, and Mark T. Cox of New York have been elected directors of the Lackawanna Steel Company of Buffalo.

S. A. Davis is now district manager of the Vandergrift-Apollo mills of the American Sheet & Tin Plate Company.

J. G. Thropp, Jr., of Duquesne, Pa., formerly of Everett, Pa., has been appointed superintendent of the Donora blast furnaces of the Carnegie Steel Company.

Reports, as yet unconfirmed, are to the effect that A. M. Mattice, chief engineer of the Westinghouse Electric & Mfg. Company of Pittsburgh, has resigned to join the Allis-Chalmers Company. Mr. Mattice, who was a chief engineer in the United States Navy, was connected for many years with E. D. Leavitt, consulting engineer of the Calumet & Hecla Mining Company.

Official announcement is made that Philetus W. Gates and Henry W. Hoyt, respectively general superintendent and second vice-president of the Allis-Chalmers Company, Chicago, will on or before April 1 retire from active participation in the management of the affairs of that company. Messrs. Gates and Hoyt have been associated in business since 1884. For 15 years prior to the merging of the Gates Iron Works into the Allis-Chalmers Company in 1901 Mr. Gates was president and Mr. Hoyt secretary and treasurer of the Gates Works, and that industry was indebted largely to them for its upbuilding. After a vacation spent in travel they will return to Chicago and re-engage in business along other lines. Both Mr. Gates and Mr. Hoyt have been contemplating retiring from the Allis-Chalmers Company for some time, as they were never entirely satisfied with their status in the Allis-Chalmers Company since their formation, and they concluded that the present period of change and reorganization gave the opportunity of withdrawing without prejudice to the interest of the stockholders of the old Gates Iron Works. No successors to their positions with the Allis-Chalmers Company have been definitely selected, and it is possible that their duties will be distributed among other officials. In the reorganization Edward D. Adams, chairman of the board and one of the largest stockholders of the company, will be virtually in control. B. H. Warren, who succeeded Charles Allis as president, will have active charge of the executive affairs of the constituent plants, and Mr. Mattice, late of the Westinghouse Company, the newly appointed chief engineer, will supervise the engineering and mechanical affairs of the company. It is not yet known what effect the reorganization will have on the status of J. B. Allan, who some months ago was made general manager of the company. W. J. Chalmers remains with the company as the vice-president.

The Tennessee Coal, Iron & Railroad Company.

Preliminary figures of the annual report of the Tennessee Coal, Iron & Railroad Company have been issued. These figures show an increase in net profits over the previous year of over $312,000. Surplus earnings, after deducting an allowance for depreciation, increased about $321,000. The sum of $1,734,000 was carried forward to surplus account after charges, depreciation and preferred dividend. The income account for the year ended December 31, 1903, compared with the previous year, is as follows:

	1903.	1902.	Changes.
Net earnings from operation	$2,889,956.73	$2,595,095.20	Inc. $294,861.53
Other income	15,019.68	7,683.67	Inc. 7,336.01
Total profits	$2,904,976.41	$2,602,778.87	Inc. 302,197.54
Less interest on bonds and dividends on guaranteed securities	739,527.50	750,283.09	Dec. 10,755.59
Net profits	$2,165,448.91	$1,852,495.78	Inc. 312,953.13
Deduct depreciation	411,422.41	419,536.82	Dec. 8,114.41
Surplus earnings	$1,754,026.50	$1,432,958.96	Inc. 321,067.54
Less dividends on preferred stock	19,864.00	23,174.66	Dec. 3,310.66
Carried forward to surplus account	$1,734,162.50	*	

* Balance remaining to credit of profit and loss at close of operations in 1902 was written off against plant and equipment account.

During the year 1903 the company expended for construction and permanent improvement, including new blast furnace now in process of erection at Ensley, new blowing engines, boilers, stock-bins, pumping station and water-purifying plant at Ensley furnaces, new boilers at Ressemer, Oxmoor and South Pittsburgh furnaces, installation of electric haulage, pumping and lighting at No. 3 Pratt (coal) mine, with power to operate No. 4, new mining equipment at Red Mountain ore mines, Dolcito quarry and the Brown ore properties at Greeley, Ala., and Bartow, Ga., addition to plant at the several coal mines, hot metal mixer, additions to rail mill, new electric power plant at Ensley Steel Works, new electric light plant at Bessemer, to supply Bessemer furnaces, rolling mill and iron mines, 204 new miners' houses, &c., the sum of $2,267,740.62; for purchase of land and the consolidation of mineral holdings, $97,933.70; for stripping brown ore, to be charged to cost of ore as produced, $24,554.59; total expenditure for property account during 1903, $2,390,228.91. During the years 1901 and 1902 there was expended for construction and permanent improvements and for purchases of land, the sum of $2,254,924.10, making a total expenditure for property account during the last three years of $4,645,153.01, all of which was paid for out of current earnings.

During the same period there was no increase in capital stock and the net indebtedness of the company was decreased $564,409.44. There has been charged off in the same time for depreciation on old plant and equipment (namely, that which was on the ground prior to January 1, 1901), $3,687,801.22, and for depreciation on land (by reason of the removal of ore and coal), all being charged to cost of product as royalty, $663,275.74. The total amount charged off for the above reasons in the last three years is $4,351,076.96.

The annual meeting will take place on May 5.

Iron and Steel Exports to Japan.

The exports of iron and steel manufactures from San Francisco to Japan for 1903 were as follows:

Agricultural implem'ts.	$5,712	Firearms	$8,144
Automobiles	1,470	Cash register, 1	150
Bicycles	166,840	Electrical machinery	70,592
Watches and clocks	492	Pumps, &c.	5,651
Watch movements, &c.	57,535	Sewing machines	1,309
Instruments, electrical	26,781	Boilers and parts	44,822
Instruments, various	22,897	Typewriters, &c.	13,389
Wire, 112,600 pounds.	5,050	Machinery, various	183,801
Locks	2,202	Wire nails, 161 kegs	512
Saws	325	Pipe, &c.	10,444
Printing presses	1,572	Safes, 19	5,000
Tools	5,261	Scales	697
Castings	11,638	Stoves	1,706
Cutlery	545	Hardware, various	20,289
Total			$624,776

These figures are nearly $100,000 short of those of 1902. The falling off has been principally in bicycles and watch movements; about 40 per cent. in the former and 50 per cent. in the latter. There has been an increase in pumps, machinery of various kinds, boilers and parts, hardware, typewriters, iron pipe, safes, &c., and a decrease in tools, castings, locks, stoves, &c. A large quantity of nails used to be shipped from this port to Japan. Once the nail was a leading article, but now it has all but disappeared from the list of exports thither.

The Prentice Bros. Company, of Worcester, Mass., manufacturers of machine tools, have reorganized their board of directors by the addition of Loring Coes, of the Coes Wrench Company. Vernon F. Prentice remains as president, and Harry V. Prentice is the treasurer and clerk. Mr. Coes fills the vacancy in the board caused by the resignation of E. W. Whitmore, and Harry V. Prentice fills that gentleman's old offices as treasurer and clerk. All the directors are Worcester men.

Ella Furnace, of Pickands, Mather & Company, at West Middlesex, Pa., was blown in on Monday, the 14th, after being idle about six months.

The United States Steel Corporation's Report.

The second annual report of the United States Steel Corporation has been issued, covering operations for the year ending December 31, 1903. The report fills 51 broad pages, and is the most complete and exhaustive report ever made by a corporation to its stockholders. We take from it the following particulars:

INCOME ACCOUNT FOR THE YEAR 1903.

The total net earnings of all properties after deducting expenditures for ordinary repairs and maintenance (approximately $22,000,000), also interest on bonds and fixed charges of the subsidiary companies, amounted to..		$109,171,152.35
Less appropriations for the following purposes, viz.:		
Sinking funds on bonds of subsidiary companies.....	$1,598,012.48	
Depreciation and extinguishment funds (regular provisions for the year).....	4,599,822.47	
Extraordinary replacement funds (regular provisions for the year)	9,297,530.89	
Epecial fund for depreciation, improvements and construction	10,000,000.00	
		25,495,365.84
Balance of net earnings in the year 1903.		$83,675,786.51
Deduct:		
Interest on United States Steel Corporation 50-year 5 per cent. gold bonds.....	$15,195,850.00	
Interest on United States Steel Corporation 10-60-year 5 per cent. gold bonds.....	3,886,946.38	
Sinking fund on United States Steel Corporation 50-year 5 per cent. gold bonds.....	3,040,000.00	
Sinking fund on United States Steel Corporation 10-60-year 5 per cent. gold bonds.....	757,500.00	
		22,880,296.38
Balance		$60,795,490.13
Less: Charged off for depreciation in inventory valuations and for the adjustment of sundry accounts.....		5,378,837.63
Balance		$55,416,652.50
Dividends for the year 1903 on United States Steel Corporation stocks, viz.:		
Preferred, 7 per cent.....	$30,404,173.41	
*Common, 2½ per cent.....	12,707,562.50	
		43,111,735.91
Undivided profits or surplus for the year.....		$12,304,916.59

* Dividends of 3½ per cent. on common stock were actually paid in 1903, but the dividend of 1 per cent. paid March 30, 1903, was charged to the income account for 1902.

The surplus thus credited to 1903 is $21,948,740.16 less than the surplus of 1902.

SURPLUS SINCE APRIL 1, 1901.

Surplus or working capital provided in organization		$25,000,000.00
Surplus accumulated by all companies from April 7, 1901, to December 31, 1902, per annual report for 1902.....	$52,874,597.05	
Less adjustments in sundry accounts in 1903.....	48,702.70	
		52,825,894.35
Surplus of all companies for the year 1903....		12,304,916.59
Total.....		$90,130,810.94
Less: Expense conversion preferred stock and sale of 10-60-year bonds ($783,560 not yet paid)..	$6,800,000.00	
Charged off on December 31, 1903, by authority of the Board of Directors, for expenditures made from surplus since April 1, 1901, for construction and for payment of capital liabilities.....	17,234,128.58	
		24,034,128.58
Balance of undivided surplus, December 31, 1903		$66,096,682.36

Maintenance Expenditures.

The expenditures made on all properties during the year for maintenance, renewals and extraordinary replacements equaled the sum of $34,785,191.21. This entire amount has been charged to current operations. The physical condition of the properties has been not only fully maintained but largely improved and strengthened by these extensive outlays, both in respect to increasing the productive and operating capacity and reducing operating costs. The expenditures for extraordinary replacements in 1903 exceeded those for 1902 by $5,012,985.23. The total, as above, is apportioned as follows:

	Ordinary maintenance and repairs.	Extraordinary replacements.*	Total.
Manufacturing properties	$16,046,275.00	$10,267,974.58	$26,314,249.58
Coal and coke properties	967,705.49	194,131.56	1,161,837.05
Iron ore properties	299,204.79	212,019.53	511,224.32
Transportation properties:			
Railroads	3,989,669.49	1,770,241.81	5,759,911.30
Steamships and docks	389,368.61	481,671.53	871,040.14
Miscellaneous properties	153,190.00	13,738.82	166,928.82
Total expended in 1903	$21,845,413.38	$12,939,777.83	$34,785,191.21
Total expended in 1902	21,230,218.13	7,926,792.60	29,157,010.73
Increase	$615,195.25	$5,012,985.23	$5,628,180.48

* These expenditures were paid from funds provided from earnings to cover requirements of the character included herein.

In 1902 the amount of $26,197,400.53 was set aside for extraordinary replacement and improvement. The balance to the credit of this fund on December 31, 1903, was $12,936,672.08. The balance of the fund for special improvement and construction was $2,332,940.61. These balances are included in the current assets of the corporation.

Number of Employees.

The average number of employees in the service of all companies and the salaries and wages paid during the fiscal year 1903, in comparison with the fiscal year 1902, were as follows:

	1903.	1902.
Manufacturing properties.....	123,397	125,326
Coal and coke properties.....	17,873	16,519
Iron ore mining properties.....	13,768	13,465
Transportation properties.....	11,033	11,160
Miscellaneous properties.....	1,638	1,657
Totals	167,709	168,127
Total annual salaries and wages paid	$120,763,896	$120,528,343

Production.

The production of the several properties for the year, in comparison with the results for the fiscal year of 1902, was as follows:

	1903. Tons.	1902. Tons.
Iron ore mined:		
From Marquette Range.....	1,412,402	1,487,370
From Menominee Range.....	2,106,443	2,675,754
From Gogebic Range.....	1,867,856	2,064,492
From Vermillion Range.....	1,918,584	2,057,537
From Mesaba Range	8,058,070	7,778,026
Totals.....	15,363,355	16,063,179
Coke manufactured.....	8,658,391	9,521,567
Coal mined, not including that used in making coke.....	1,120,733	709,367
Limestone quarried.....	1,268,930	1,313,120
Blast furnace products:		
Pig iron.....	7,123,053	7,802,812
Spiegel	121,779	128,265
Ferromanganese and silicon.....	34,409	44,453
Totals.....	7,279,241	7,975,530
Steel ingot production:		
Bessemer ingots.....	6,191,660	6,759,210
Open hearth ingots.....	2,976,300	2,984,708
Totals.....	9,167,960	9,743,918
Rolled and other finished products for sale:		
Steel rails.....	1,934,315	1,920,786
Blooms, billets, slabs, sheet and tin plate bars.....	493,292	782,637
Plates	519,713	649,541
Merchant steel, skelp, shapes, hoops, bands and cotton ties.....	997,595	1,254,560
Tubing and pipe.....	795,821	744,062
Rods	101,699	109,330
Wire and products of wire.....	1,126,605	1,122,809
Sheets—black, galvanized and tin plate	855,215	783,576
Finished structural work.....	469,692	481,029
Angle and splice bars and joints.....	138,709	139,954
Spikes, bolts, nuts and rivets.....	53,259	42,984
Axles	119,716	136,787
Sundry iron and steel products.....	30,059	29,177
Totals.....	7,635,690	8,197,232

Spelter	23,841	23,982
Copperas	15,407	14,224
	Barrels.	Barrels.
Cement	644,286	486,357

Inventories.

The total inventories of all properties on December 31, 1903, amounted to $107,976,523, in comparison with an aggregate of $104,390,844 on December 31, 1902, an increase of $3,585,679. This increase is more than accounted for in the item of ore alone, which shows an increase over last year of $7,946,049, or 23 per cent., in inventory valuation, and an increase of 31 per cent. in quantity on hand. This increase in the quantity of ore on hand is due partly to the fact that inventories this year include the stocks of the Union Steel Company (not embraced last year) and partly owing to the diminution of ore conversions during the last quarter. Inventory valuations are conservative. They were taken on the basis of actual purchase or production cost of materials to the respective companies holding the same, unless (as happened in some instances) such cost was above the market value on December 31, 1903, in which cases the market price was used. The aggregate inventory valuation of all raw, partly finished and finished materials produced within the organization is very largely below the market prices on December 31, 1903. No profit is taken up by any one subsidiary company on materials and products of its own production until the same have been shipped to customers. The estimated profits carried as an asset in inventories for gains on uncompleted bridge and structural contracts equal only about one-half of the profit which it is expected will be realized thereon when completed. The following is a general classification of inventory valuations on December 31:

Ores		$42,018,988
Pig iron, scrap, ferro and spiegel		5,885,039
Coal and coke		1,871,404
Copper, nickel, aluminum and alloys		346,798
Pig tin, lead, zinc, spelter, dross and skimmings		1,454,308
Limestone, fluxes and refractories		1,210,915
Rolls, molds and steels		2,553,260
Manufacturing supplies, stores and miscellaneous items not otherwise classified		7,837,113
Ingots, steel and nickel		881,979
Blooms, billets, slabs, sheet and tin bars, &c		5,321,339
Wire rods		540,516
Skelp		1,152,572
Finished products		21,564,586
Mining supplies and stores (for ore and coal)		1,983,046
Railroad supplies and stores		1,368,697
Merchandise of supply companies		614,520
Material, labor and expense locked up in bridge and structural contracts, including estimated profit thereon	$23,468,732	
Less bills rendered on account	16,028,984	
		7,439,748
Stocks abroad and on consignment		1,347,165
Material in transit		2,584,530
Total		$107,976,523

Number of Stockholders.

The number of stockholders of the United States Steel Corporation on the respective dates shown below was as follows:

	1904.	1903.	Increase.
Preferred (February, 1904 and 1903)	42,720	31,799	10,921
Common (December, 1903 and 1902)	37,237	26,830	10,407
Totals	79,957	58,629	21,328

The offer to the employees to subscribe for the preferred stock was renewed at the end of the year 1903 for the succeeding year, and resulted in a subscription by 10,248 employees for 32,519 shares.

General.

On November 1, 1903, the United States Steel Products Export Company, whose stock is held by the Federal Steel Company, made arrangements to act as selling agents for all subsidiary companies. The result has been an increase in the export trade.

During the year general trade conditions materially changed and the business of the subsidiary companies, in common with the business of all others, suffered by reason of the falling off in orders. The effect upon profits has been shown accurately from time to time in the published statements. So soon as it became evident to the directors that there was likely to be a large diminution in the net profits to be realized by way of dividends from subsidiary companies it was deemed wise and prudent to reduce the dividend on the common stock of the corporation, and later, for the same reason, to suspend payment of dividends on this stock. In the determination of these questions the directors gave careful consideration to all the facts and circumstances bearing upon the subject and due regard to the relative rights and claims of all who are interested in the continuous and permanent success of the corporation and the advancement of their business.

On December 31, 1903, the tonnage of unfilled orders on the books was 3,215,123 tons of all kinds of manufactured products, in comparison with a tonnage of 5,347,253 at corresponding date in the previous year.

CONDENSED GENERAL PROFIT AND LOSS ACCOUNT.

Gross sales and earnings		$536,572,871.38
Manufacturing and producing cost and operating expenses		*409,268,599.41
Balance		$127,304,271.97
Miscellaneous manufacturing and operating gains and losses, net	$1,068,793.52	
Rentals received	651,250.06	
		1,720,043.58
Total net manufacturing, producing and operating income		$129,024,315.55
Proportion of net profits of properties owned but whose operations (gross revenue, cost of product, expenses, &c.) are not included in this statement	$1,327,730.59	
Interest and dividends on investments and on deposits, &c	2,220,819.58	
		3,548,550.17
Total income		$132,572,865.72
Administrative, selling and general expenses (not including general expenses of transportation companies)	$11,942,916.42	
Taxes	2,972,599.90	
Miscellaneous expenses	393,917.34	
Commercial discounts and interest	1,538,418.65	
		16,847,852.31
Balance of income		$115,725,013.41
Interest on bonds and mortgages of the subsidiary companies	$5,756,488.06	
Interest on bills payable and purchase money obligations of the subsidiary companies	797,373.00	
		6,553,861.06
Net earnings for the year 1903		$109,171,152.35

* Includes charges for ordinary maintenance and repairs, approximately $22,000,000.

Labor Notes.

An instance of a large strike benefit, larger than the wages received by workmen while in employment, is that of the strike, now settled, of printers at Boston, where some men receiving $12 a week have been drawing a strike benefit of $14 a week, receiving $7 from the National Typographical Union and the same amount from the local organization.

Boiler makers employed in the Boston & Albany repair shops at West Springfield, Mass., are on strike for shorter hours, alleging that they should be given the same hours as other branches of the shops' forces.

The boiler makers of the American Locomotive Works of Scranton, Pa., who were on strike because of a disagreement as to wages, have returned to work. An agreement for one year was signed by both parties.

The iron industry of the Shenango Valley is now about 100 years old. The making of iron at New Castle, Pa., may have been tried by 1803, but it can scarcely be proved that much was done before 1804, and the early ventures can be called little more than experiments. John Carlisle Stewart, who laid out the original town of New Castle in the year 1796, appears to have had a little forge and foundry about ½ mile north of the town in the early years of the last century. His forge, like all other early iron works in the locality, derived its power from a dam on the Neshannock Creek. Some remains of this earliest iron works are still visible.

MANUFACTURING.

Iron and Steel.

The Massillon Iron & Steel Company, Massillon, Ohio, have increased their capital stock from $150,000 to $500,000.

The Shenango Furnace Company, Pittsburgh, have started up their second stack at Sharpsville, Pa. The third stack will be blown in as soon as it can be gotten ready.

A recent explosion at Swede Furnace, Swedeland, Pa., damaged the furnace top to the extent that it was necessary to blow the stack out.

No. 1 furnace of the Clairton Steel Company, at Clairton, Pa., will be put in blast at an early date. No. 3 stack of this company is practically completed, but has never been operated. It will also likely be started before long.

The Crum Lynne Iron Works, Chester, Pa., which have been in the hands of a receiver for some months, have started up in full under an order of the court, so that numerous contracts secured before the appointment of a receiver can be completed for Pittsburgh parties. Former employees were given the preference over new men, and were notified in advance of a proposed 10 per cent. reduction. There was little or no objection, all being glad to secure employment. There were no murmurings of a strike.

Stack No. 2, of the Lehigh Steel & Iron Company's furnace at Aineyville, Pa., collapsed last week after having been out of blast about one week.

The Chesapeake Nail Works, Harrisburg, Pa., are being operated after a shut down of about one month.

The steel plant of the West Virginia Steel Company, Wheeling, W. Va., which has never been operated, was sold at trustees' sale last week to Charles H. Copp for $39,950.

The Colonial Iron Company have banked their furnace at Riddlesburg, Pa., because of the high cost of making iron at the stack. It is probable that in the near future the furnace will be remodeled and the capacity increased to 200 tons per day.

Furnace "C" of the Colorado Fuel & Iron Company, Pueblo, Col., was blown in last week. This is the first furnace to be put into operation since the works were shut down last November.

W. P. Nebelt and B. F. Miller have been appointed receivers for the Chattanooga Furnace Company, Chattanooga, Tenn. The bonded indebtedness of the company is about $100,000 and the floating debt $25,000.

The Buffalo & Susquehanna Iron Company, Buffalo, N. Y., have increased their capital stock from $600,000 to $1,000,000.

Persistent rumors have been circulated that the Tidewater Steel Company, Chester, Pa., which recently closed down and laid off indefinitely all their hands, including the office force, would merge with the South Chester Tube Company, but in an interview this week G. W. Cook, the general manager of the latter company, denies emphatically that such a step is contemplated.

The Hussey Drop Forge & Mfg. Company, Cleveland, Ohio, are producing a new design of weldless nickel steel for automobile use. For working the nickel steel the company designed a special furnace which is fed by an automatic stoker to secure the required even temperature.

Stack No. 1 of the Warwick Iron & Steel Company, Pottstown, Pa., has been blown in. The output of the two furnaces is 650 tons per day.

General Machinery.

The American Blower Company, Detroit, Mich., are shipping for the account of the Under-Feed Stoker Company of America, Marquette Building, Chicago, a consignment of 78 Jones stokers to the Union Electric Light & Power Company, St. Louis, Mo. This complete stoker equipment is to be installed in the Biddle street station of the latter company, reputed to be the largest internally fired boiler plant in the country, and in fact classed among the largest steam plants in the world equipped with mechanical stokers. They are at present installing their "A B C" fan system of heating in the new shops of the Olds Gasoline Engine Works at Lansing, Mich. The building is one story in hight, being a steel frame structure. It consists of one division running east and west, 130 x 438 feet; one division running north and south, 62 x 346 feet; one locker, office and wash room building, 36 x 141 feet, and one paint storage building, 20 x 20 feet. The heating apparatus is arranged to provide for an addition 130 x 438 feet to the main portion of this building, and to maintain an average temperature of 65 degrees F. throughout the present structure, with the exception of the offices and paint shop, which are to be heated to 70 degrees. This apparatus consists of four units, each made up of an "A B C" sectional base heater, having a capacity of 3250 lineal feet of 1-inch pipe, to which is attached an "A B C" full housed steel plate fan. The fan located in the 62-foot wing is special, having a housing 100 inches high and a wheel 66 inches in diameter. The other three fans are regular 120-inch "A B C" fans, with wheels 72 inches in diameter. All of the fans are operated by independent motors. All of the heating apparatus is carried on girders, which span the roof trusses in the wings, and is entirely above the bottom chords.

The National Electric Company, Milwaukee, Wis., successors to the Christensen Engineering Company, manufacturers of air brake and electrical machinery, have just moved their executive offices and engineering department to their new building located at the works. The building is constructed of cement blocks and is 66½ x 200 feet. Extensions and improvements are also being made in their shops to supply the necessary facilities for handling the company's constantly growing business.

The Armstrong Machine & Well Works Company, Welsh, La., recently incorporated with a capital stock of $25,000, have succeeded to the business of the Welsh Machine & Well Works Company. The plant of the Welsh company was destroyed by fire last September, and not being able to get a satisfactory adjustment of their losses by the insurance companies, they sold the property to the Armstrong company, who rebuilt the plant and installed new mach'nery, which they now have in operation. The machinery was purchased through William C. Johnson & Sons, St Louis, Mo., and the Rhan-Mayer Carpenter Company, Cincinnati, Ohio. The company operate a machine shop, blacksmith shop, sheet iron and boiler shop, and carry a full and complete line of oil well and mill supplies, pumps, engines, threshers, &c. J. P. Nicholas is president, William Murray vice-president, and Jno. W. Armstrong secretary and treasurer.

Edward Sellers, Oak Hall, Pa., manufacturer of agricultural implements, has purchased a three-story stone building, 36 x 102 feet, which he will fit up as a machine and wood working shop to take care of those departments of his business, for which his present shop is too crowded. The newly acquired property is equipped with a 25 horse-power turbine water wheel.

The C. G. Thompson Mfg. Company, Mexico, Mo., have incorporated for the manufacture of flour and corn mill machinery. For the next few months they will have their machines made by contract. It is then their intention to build and equip a plant, no details of which have as yet been arranged.

The E. W. Spacke Machine Company, Indianapolis, Ind., have purchased a tract of ground just north of their present building, upon which they propose erecting a steel frame machine shop, having a frontage of about 80 feet and running through from Madison avenue to Pennsylvania street. They may also build a foundry later.

The Clemons Machine Company, Hornellsville, N. Y., recently incorporated with a capital stock of $20,000 for the manufacture of belt sanding machines. The company are having the machines made by contract and do not intend to erect a plant at the present time. The incorporators are D. T. Clemons, G. Conderman, and J. F. Richardson.

The recently incorporated Oxford Machine Company, Oxford, Pa., are occupying the John W. Woodside plant, formerly operated by the Oxford Mfg. Company, where they will manufacture poultry picking machines, cord knotters, lifeboats and rotary engines. Francis Terwilliger is manager.

John D. Walton is in charge of the Morgan Iron Works, foot of Ninth street, East River, New York, settling up the affairs of the firm, who decided some time ago to discontinue the business.

There is no truth in the current report that the Philadelphia & Reading Railway contemplate the erection of an addition to their locomotive shops at Reading, Pa.

The Woodward & Rogers Company, Hartford, Conn., manufacturers of machine tools, have gone into the hands of a receiver, and the Superior Court has appointed Charles M. Joslyn. On March 3 the stockholders voted to discontinue the business, and receivership proceedings were instituted that existing contracts might be cleared up and the property be protected from attachment. A recent inventory showed assets of $32,000, while the obligations will probably amount to $18,000. The corporation is capitalized at $30,000.

The Brown-Wales Company, 69-83 Purchase street, Boston, have added to their business a department devoted to power transmission machinery, and have taken the following agencies: American steel split pulleys, Reeves wood split pulleys, Shaw patent compression shaft couplings, Johnson's patent safety collars, Robinson's right angle drives, B. & C. clutches, National ring-and-wick oiling hangers, and Graton & Knight Mfg. Company's leather belting. They have also added a line of cold rolled shafting.

The Chapman Double Ball Bearing Shafting Company, Boston, have been consolidated with the American Compound Bearing Company, 25 Broad street, New York, the latter company taking over the entire business of the Boston concern. The American Compound Bearing Company had already controlled all the Chapman ball bearing rights with the exception of those pertaining to shafting, and their new acquisition gives them the complete line. It is not decided whether or not the Boston branch will be discontinued.

The Glen Driller Mfg. Company, New Kensington, Pa., have been reorganized and are now known as the Columbia Driller Mfg. Company. They have opened a branch office in the Farmers' Bank Building, Pittsburgh.

The Geiser Mfg. Company, Waynesboro, Pa., have closed a deal with Col. A. J. Bester of Johannesburg, South Africa, for a lot of farming machinery consisting of plows, engines, cultivators and threshers. This is the company's first shipment to South Africa.

The Falkenau-Sinclair Machine Company, Philadelphia, have increased their capital stock from $100,000 to $150,000.

The Marion Machine, Foundry & Supply Company, Marion, Ind., have increased their capital stock from $25,000 to $35,000.

The Baltimore & Ohio Southwestern Railway Company have put a night force on at their machine shops, Washington, Ind., giving employment now to the largest number of men in the history of the shops. The company are preparing for heavy traffic on account of the World's Fair.

The Monarch Machinery Company, 39 Cortlandt street, New York, recently incorporated, with a capital stock of $50,000, to deal in machinery, gasoline and steam engines, boilers, &c. They make a specialty of the Monarch gasoline engine, stationary, portable and traction, which they have built by contract. The officers are F. A. Field, president; C. F. Dietz, vice-president; F. D. Van Atta, secretary, and M. L. Fleischmann, treasurer.

The improvements under way at the plant of the Landis Machine Company, Waynesboro, Pa., include the construction of a new blacksmith shop to make room for a pattern shop, for which the present blacksmith shop will be used. A complete line of pattern making machinery is being installed, orders for most of which have been placed. These changes were necessitated by the increasing demand for their new bolt cutter, and they are about ready to turn them out in large quantities.

The Avery Mfg. Company, Peoria, Ill., have received an order from Agar, Cross & Co., who are large exporters having headquarters at New York and offices in Buenos Aires, Argentine Republic, and Glasgow, Scotland, for 100 of their largest traction engines and 65 of their largest separators, equipped with self feeders, wind stackers, recleaners and other special attachments. The list price of the order is about $350,000. This is probably the largest order ever received for this class of machinery for shipment to one port. This machinery will all go to Buenos Aires and will be sold in the Argentine Republic and Uruguay. Something of the magnitude of the business will be realized when it is known that it will require 200,000 feet of lumber to box it for export, and that it will require something like 80 cars to move the material to the seaboard, each car containing about 45,000 pounds. Until the present season, which is just closing, there was not a single export from the Avery factory to South America. This season there were four representatives sent to assist in introducing the machines, and the order just received is sufficient proof of the successful operation of the machines this year.

The Royersford Foundry & Machine Company, Royersford, Pa., continue fairly busy in all departments. Inquiries for their line of punch and shears have been numerous, but they experience some delay in closing orders. Some of their recent deliveries include double punch and shearing machines to the Prentiss Tool & Supply Company, New York; A. A. Phillips Company, Brooklyn, N. Y., and Manning, Maxwell & Moore, New York.

The C. O. Simmons Construction Company, Cleveland, Ohio, have been incorporated with $5000 capital stock by Clinton O. Simmons, Walter S. Sapp, M. E. Bennington, E. Rooke and John L. Stockwell, Jr. They will manufacture a new type of steam ditching machine, the invention of Clinton O. Simmons.

The Aultman & Taylor Machinery Company, Mansfield, Ohio, are making a number of improvements to their plant. They are adding new machinery and are erecting a building, 60 x 76 feet, as an addition to the testing department for the separators which they manufacture.

The C. E. Sutton Company, Toledo, Ohio, have been incorporated with $200,000 capital stock by Charles E. Sutton, Curtis T. Johnson, Ralph A. Holbrook, S. D. Carr and E. T. Rowley. It is announced that the company are a consolidation of the Caldwell Furnace & Foundry Company, Toledo; the Barnum Tool Company, Jackson, Mich., and the Breamer Company, Kalamazoo, Mich., and it is stated that the Jackson and the Kalamazoo plants will be removed to Toledo. The company will manufacture heating apparatus and machine tools.

The Cleveland office of the Marshall & Huschart Machinery Company have just sold to the Olds Motor Works, Detroit, manufacturers of the Olds automobile, an equipment of ten special Lodge & Shipley lathes.

The National Acme Mfg. Company, Cleveland, Ohio, manufacturers of the National-Acme automatic screw machine and screw machine products, report that they are very busy in their products department, and that within the past few weeks they have put on a night shift. Their machinery department is running with about the same force that it was last year at this time. Their foreign business on machinery has increased during the past few months, although of late, owing to war scares, there has been some falling off in France and Germany. They recently shipped some special machinery to Japan for producing horseshoe corks for Japanese cavalry horses.

Power Plant Equipment.

J. D. Lyon & Co., Farmers' Bank Building, Pittsburgh, sold last week to the Monongah Glass Company, Fairmont, W. Va., one 60 horse-power Mertes duplex gas engine, and one 60 horse-power Mertes duplex gas engine to the Martin Hardsocg Company, Allegheny, Pa.

The Southern Boiler & Iron Works, George W. Richardson and Joseph J. Godard, proprietors, Mobile, Ala., have erected a new shop, with a frontage of 53 feet and depth of 162 feet, which has been equipped with new machinery. Lines manufactured are boilers, tanks, smoke stacks, with all classes of work in sheet metal and structural iron, with general repairing. The works are now running full.

George B. Elliott has been appointed receiver of the W. H. Smith Company, Indianapolis, Ind., dealers in electrical supplies and power equipment, on petition of the Gilmore Electric Company of South Boston. The liabilities are given at $33,000 and apparent assets at $59,000. The failure is attributed to the prolonged illness of W. H. Smith, president of the company.

Howard Mountz of Garrett, Ind., was appointed receiver of the Model Gas Engine Company, Auburn. The company are indebted to various banks to the amount of $112,000. The assets are estimated at $192,000.

The Hertner Electric Company, Cleveland, Ohio, have secured a contract for a number of special motors to be used in electric launches being built for use at the St. Louis Exposition. The Willard Storage Battery Company, Cleveland, are supplying storage batteries for the launches.

The Elwell-Parker Electric Company, Cleveland, Ohio, recently closed a contract for a large number of automobile motors. They are building a number of special and standard crane motors and several 200 horse-power heavy duty hoisting motors.

Foundries.

The plant of the Haywood Foundry & Machine Company, Monongahela, Pa., has changed hands, and the new owners will make some changes and additions to the works.

The plant and business of the Condor Iron Foundry Company, East Boston, Mass., have been taken over and consolidated with the business of George H. Gibby, under the name of the Gibby Foundry Company. The business continues under the same management as heretofore.

Miller & Beard, recently organized, have leased the Glenville Foundry, at Glenville, Pa., which they have started up for repair work and for making iron castings. No new equipment is required. G. Malden Beard is president and secretary, and S. R. Miller treasurer and manager.

The Susquehanna Foundry & Machine Company, Watsontown, Pa., recently incorporated, have taken over the brass and iron foundry formerly operated by the Pardee Car & Machine Works. They are also building machine and electroplating departments, which they will operate in connection with the foundry for the manufacture of light gray iron castings, brass and iron hardware goods. The plant will be equipped with modern machinery and will be ready for operation about April 1. Lee S. Lesser is general manager.

The new plant of the National Steel Foundry Company, New Haven, Conn., was put into commercial operation last week.

John Hooley and M. B. Tierney will purchase the old Huber foundry at Danville, Pa., which has been idle for several years, and will establish therein a stove factory and general job molding business.

The Danville Stove Company, Danville, Pa., are heavy losers as a result of last week's flood in the Susquehanna Valley. Ten thousand flasks belonging to the molding department were carried away, and hundreds of patterns destroyed. Every department of the works was under water.

Abendroth Brothers, New York, have purchased a piece of property at Niagara Falls, where they intend to erect a plant. Plans for the building are not yet prepared, and it is probable that nothing will be done toward its erection until 1905.

The Vulcan Foundry, New Castle, Pa., has started in all departments after a long idleness caused by slackness of orders.

Fires.

The Carlisle works of the Standard Chain Company, Pittsburgh, were damaged $10,000 by fire last week.

The plant of the Maritime Nail Works, St. John, N. B., was burned last week, entailing a loss estimated at $50,000.

The Hoover Wagon Works, York, Pa., were recently destroyed by fire. The loss is placed at $75,000.

The Haak Lumber Company's mill at Haakwood, near Wolverine, Mich., was destroyed by fire last week. The loss is placed at $160,000.

The plant of the Knightstown Torpedo Company, Knightstown, Ind., was destroyed by an explosion March 12.

Bridges and Buildings.

The Milwaukee Bridge Company, Milwaukee, Wis., have been awarded the contract for erecting a steel bridge over the tracks of the Chicago & Northwestern Railway in the Eighteenth Ward, Milwaukee, the cost being $25,220. This is the only bridge over the tracks of the road to be built by the city, the company building all the others made necessary by the lowering of their tracks.

The partnership of Witherspoon, Englar & Co., Chicago, has been formed by John M. Witherspoon and William C. Englar. The firm will make a specialty of heavy construction work, such as warehouses, freight houses, grain elevators and factory construction.

A. Y. Bayne & Co., Minneapolis, Minn., have secured the contract for the building of a bridge across Rum River, near Anoka, Minn., the contract price being $2950.

The Board of Commissioners of Vermillion County, Ind., have voted to build a bridge across the Wabash River, near Cayuga. Wm. P. Bell, auditor Newport, Ind.

The Board of Commissioners of Warren County, Ind., will build a bridge across the Wabash River this spring to cost $90,000. Robt. L. Winks, auditor, Williamsport, Ind.

The Indiana Bridge Works, Muncie, Ind., which were shut down several weeks, are in full operation again, with orders sufficient to insure a steady run.

The Canton Bridge Company, Canton, Ohio, have been awarded a contract for building a bridge at Rossford, near Bowling Green, Ohio. It will cost about $8000. Fifteen bidders were represented.

Hardware.

The Globe Mfg. Company, Taunton, Mass., manufacturers of special nails, &c., advise us that they have recently been installing new and improved machinery and have increased their output 75 per cent They now make more than 100 different special nails.

The Pittsburgh Scale Company, Pittsburgh, have applied for a charter of incorporation with a capital of $100,000. It is said they propose to build a scale works in the Pittsburgh district.

The Emerson Mfg. Company, Rockford, Ill., have increased the capital stock of their Spokane, Wash., branch from $12,000 to $35,000, it being their purpose to make a more active effort to secure trade in that territory. The company manufacture agricultural implements.

The Peru Wire Fence Company, Peru, Ind., have been incorporated, with $3000 capital, by Anson T. Reed, H. E. Whiting and Chas. E. Redman.

At a meeting of the stockholders of the Quincy Stove Mfg. Company, Quincy, Ill., held recently, it was decided to increase the capital stock from $75,000 to $125,000.

The Marion Handle & Mfg. Company, Marion, Ind., have incorporated with $125,000 capital. The directors are Wilbur M. Serviss, W. A. Nessler, H. M. Serviss and John E. Lyons.

The Waugh Safe & Lock Company, Minneapolis, Minn., have been incorporated, to manufacture fire and burglar proof safes, vaults, and all kinds of time, combination and other locks. The new company are capitalized at $100,000. C. T. Waugh of New York City and L. B., J. L. and L. E. Waugh of Minneapolis are the incorporators.

Miscellaneous.

The McKenna Brothers Brass Company, Pittsburgh, manufacturers of brass goods of various kinds, are furnishing large quantities of brass railing for the St. Louis Exposition.

The by-product coke plant of the Carnegie Steel Company, at South Sharon, Pa., was started up last week. The plant was badly damaged by a flood in January, and repairs have been completed.

W. W. Stall, president and manager of the Factory Exchange, Boston, reports the sale of the Bassett straw shops, at Franklin, Mass., owned by the Benjamin Franklin Savings Bank, to the Baltimore Chemical Engine Company, a Massachusetts corporation, of which K. P. Crawford is president and Eugene Humphrey, treasurer. This property contains nearly 60,000 square feet of floor space, with plenty of land, and is situated directly on the railroad. The plant has been idle for some time.

The Aetna-Standard Works Started.—PITTSBURGH, Pa., March 16, 1904.—For more than a year the Ætna-Standard Words of the American Sheet & Tin Plate Company, at Martin's Ferry, Ohio, and which contains 22 hot and four cold mills, has been idle in all departments. The employees of the plant became very tired of their long enforced idleness, and recently drew up a petition, voluntarily addressed to the American Sheet & Tin Plate Company, asking that the plant be started. If this were done the men promised to agree to accept and work under the same wage scale that is now and has been in force at the Vandergrift works of the American Sheet & Tin Plate Company. The scale of wages at the Vandergrift works is about 20 per cent. less than that in force at union sheet mills. The company accepted the proposition of the men, and the Ætna-Standard Works are now in partial operation, and will be run to full capacity as soon as possible.

George Henry Firth, superintendent of the plant of the Firth Sterling Steel Company, Demmler, Pa., died at his residence in the East End, Pittsburgh, on Tuesday, March 15. He had been ill but a short time of pneumonia. Mr. Firth was born in Sheffield, England, and was 47 years of age.

A Hudson River Tunnel Completed

Connection by means of tunnel between New York and New Jersey was established last Friday afternoon, when one of the tubes extending underneath the Hudson River from Fourteenth Street, Jersey City, to Morton street, New York, was completed. This marked the culmination of 30 years of work and engineering development.

The history of this, the first North River tunnel, goes back to 1874. In that year a company sought and obtained a franchise, and work was begun. With the system of tunneling employed, compressed air was used at the end of the tube as it progressed underneath the river, applying it directly against the material through which the tunneling was being done. The air pressure was to support the silt soil and keep out the water. The result was a cave-in. Fourteen men died a miserable death. The project was abondoned as hopeless, although at that time there were predictions that engineering methods would advance to a point where the project would be feasible despite the prevailing pessimism.

Some boring had been done by these primitive methods, however, and in 1890 a syndicate of English capitalists was formed. There was more boring. But when they struck a ledge of rock they gave up in despair, although they had scooped out 1500 linear feet in the north tube and 570 feet in the south one.

Then came William G. McAdoo, a New York lawyer. He attacked his task with a confident smile at the disbelief that echoed from every side. His confidence must have been contagious, though. He organized his company with a directorate of men great in the world of Wall Street. The old franchise, rights and property were bought in for a little more than $4,000,000 from the old Hudson River Tunnel Company which the Englishmen had launched. In his process of tunneling he also employed compressed air, but at the end of the tube a shield was used, which was pushed forward a distance of 36 inches at a time by means of hydraulic jacks.

Mr. McAdoo has not boasted much. Every now and then the people have heard that a tunnel was being bored, but that was all. Many, possibly, had a very indistinct idea as to where it was. Some even believed it a myth, until last week it was spread broadcast that Manhattan Borough and Jersey City would be within walking distance within a fortnight.

Charles M. Jacobs, also engineer of the Pennsylvania's tunnel enterprise, has done the technical work of supervising the building of the tubes. It is the north tube that has been opened. But the south tube is not far behind, and President McAdoo promises actual service on his trolley line before the middle of the year 1905.

All the boring of the tubes has been done by the shield process, most of it through soft silt, but about 600 feet through the rock ledge. It is the claim of the engineers that never was compressed air work prosecuted with such speed, such freedom from accidents, or such comfort to the workmen. No animals have been allowed to enter the tunnel, to consume or befoul the air, all the hauling of materials being done by small cable cars. No gas jets or oil flames have been permitted, for the lighting has been by electric bulbs throughout.

The tunnel is to be used by trolley cars solely. It never can be converted into a road for heavy trains, because it is not built on a sufficiently firm foundation. It has only the natural soil under the river to support it.

From the nearest New Jersey station to the West street station on the New York side of the trolley tunnel the distance is 1 7-10 miles. The schedule time between these points will be three minutes. The cars will be as nearly fire proof as cars can be built, and Mr. McAdoo says that he will have all steel ones if such are proved practicable in tests now progressing.

The "sister tunnel" of this one is to be built by the Manhattan & Hudson Tunnel Company between Cortlandt street, this city, and the Pennsylvania Railroad terminal in Jersey City. Mr. McAdoo is also the head of that enterprise, which is designed to benefit those of the Pennsylvania's passengers who prefer to reach downtown New York through a trolley tunnel rather than uptown New York through the railroad's own tunnel.

The Iron and Metal Trades

The better feeling in the Iron trade continues. It has found expression thus far chiefly in a livelier buying of Pig Iron in all quarters, at a moderate advance in many instances. The majority of sellers have marked up their asking prices, and it remains to be seen whether or not this will check buying now that the urgent requirements for delivery during the second quarter appear to be covered. The leading Southern interests are asking $10 for No. 2, Birmingham, when two weeks since they were selling at $9. In the Chicago district the local producers are demanding $14 per ton, an advance of $1 per ton, while along the lakes Foundry Iron, which sold under $12, has recently fetched $12.50. In Eastern Pennsylvania Forge Pig has advanced, with some good sales reported, and quite a considerable tonnage of Basic Pig has been taken by Steel works at prices ranging from $13.75 to $14, delivered. There has been an actual improvement, but the expectations and hopes of the furnace interests have not yet been fully realized.

The United States Steel Corporation have closed one option for what ultimately developed into 49,000 tons. There is still undecided an option for 40,000 tons for May delivery which does not expire until April 10. From present indications it looks as though the Iron will be taken.

Cast Iron Pipe manufacturers are studying closely the requirements which would come up if the project to supply a high pressure fire service for New York and Brooklyn should mature. It would call for about 100,000 tons, of which 80 per cent. would be needed for New York and the balance for Brooklyn.

The Pennsylvania tunnel job has made progress. Since it calls for about 300,000 tons of Castings and about 25,000 tons of Steel Plates, the work means a good deal of employment to shops and mills.

In the Finished Iron trade the principal event has been the advance in the price of Bessemer Steel Bars by the leading associated interests. It amounts to $1 per ton, making the new price 1.35c., Pittsburgh. In anticipation of it a very considerable tonnage has been booked.

The Cotton Tie manufacturers have been finally getting together, and have named 75c. per bundle as the price. Hoops, too, have been advanced.

When we turn from the lines of Iron and Steel products which enter into general consumption to those which are chiefly sold to the railroads the situation is less bright. In the lines which are not protected by agreements very low prices continue to prevail, while the tonnage of those products which are controlled by associations is still light. There seems little prospect of an improvement in the purchases of the railroads until they are able to market securities to better advantage than now.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Mar.16, 1904.	Mar.9, 1904.	Feb.17, 1904.	Mar.18, 1903.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	**$14.75**	$14.75	$14.50	$22.25
Foundry Pig No. 2, Southern, Cincinnati	12.25	12.00	12.25	21.25
Foundry Pig No. 2, Local, Chicago	**14.00**	13.25	13.50	23.00
Bessemer Pig, Pittsburgh	**14.10**	13.85	13.60	21.85
Gray Forge, Pittsburgh	**13.25**	13.25	12.75	21.00
Lake Superior Charcoal, Chicago	*14.75*	15.00	15.75	26.50
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	23.00	23.00	23.00	31.00
Steel Billets, Philadelphia	24.50	24.25	24.50	28.50
Steel Billets, Chicago	24.00	24.00	24.00	31.00
Wire Rods, Pittsburgh	**31.00**	31.00	30.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	**12.50**	11.50	11.50	18.25
O. Steel Rails, Philadelphia	**14.00**	14.50	13.50	21.25
O. Iron Rails, Chicago	16.50	16.50	16.50	24.00
O. Iron Rails, Philadelphia	**17.00**	15.00	15.00	24.50
O. Car Wheels, Chicago	14.50	14.50	14.50	24.00
O. Car Wheels, Philadelphia	13.00	13.00	13.00	24.50
Heavy Steel Scrap, Pittsburgh	**14.00**	14.00	13.75	21.00
Heavy Steel Scrap, Chicago	**11.50**	11.50	11.00	18.25
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	**1.43½**	1.43½	1.35	1.95
Common Iron Bars, Chicago	**1.50**	1.45	1.40	1.86½
Common Iron Bars, Pittsburgh	1.34¾	1.34¾	1.34¾	1.89¾
Steel Bars, Tidewater	**1.49½**	1.44½	1.44½	1.75
Steel Bars, Pittsburgh	**1.35**	1.30	1.30	1.60
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.95
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.75
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.75
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Iron, Pittsburgh	1.45	1.45	1.45	2.05
Skelp, Sheared Iron, Pittsburgh	1.50	1.50	1.50	2.10
Sheets, No. 27, Pittsburgh	2.20	2.20	2.20	2.65
Barb Wire, f.o.b. Pittsburgh	2.55	2.55	2.50	2.60
Wire Nails, f.o.b. Pittsburgh	1.90	1.90	1.90	2.00
Cut Nails, f.o.b. Pittsburgh	1.70	1.70	1.70	2.10
METALS:				
Copper, New York	12.50	12.50	12.50	14.75
Spelter, St. Louis	**4.80**	4.80	4.75	5.25
Lead, New York	**4.50**	4.50	4.40	4.65
Lead, St. Louis	**4.45**	4.47½	4.32½	4.55
Tin, New York	*27.75*	28.00	28.37½	29.80
Antimony, Hallett, New York	**7.25**	7.00	7.00	6.75
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.64	3.64	3.64	3.99

Chicago.

FISHER BUILDING, March 16, 1904.—(*By Telegraph.*)

Sharp advances in Northern and Southern Pig Iron and in several finished products have given life and tone to the market, and the question suggests itself: "Are these advances real or fictitious; will they be advanced in name only, or will they be maintained?" The answer to these questions will be met by the application of the law of supply and demand. Pig Iron producers are confident that the increased demand for Iron in the West justifies them in their advances, and that the advance will be maintained and will lead a little later to still further raises in price. Buyers of Iron, on the other hand, are trying to convince themselves that this is only another of the frequently recurring attempts on the part of producers to boost prices by main strength, and that the advance is not based on anything of a real or permanent character. The five leading producers of Southern Iron, and doubtless many smaller ones, are acting in concert, whether by mutual agreement or not is immaterial, in naming $10, Birmingham, as the minimum price at which they will sell No. 2 Foundry and No. 2 Soft Irons. This is rather a startling advance in price, as it is only a week ago that it was sold in the Chicago market on the basis of $9, Birmingham. The two leading producers of Northern Iron, who have been selling at from $13.25 to $13.50, Chicago, are now naming $14, Chicago, as their minimum delivered price for No. 2 grade. Billets, Plates and Structurals are inactive, with no changes in prices. Sheets are wavering and uncertain, with each mill getting business at whatever price it can. The same is true of Boiler Tubes. Merchant Pipe is extremely active, with mills full of business. Cast Iron Pipe is rather slower than usual at this season of the year, owing both to the unseasonably

cold weather and to the difficulty municipalities experience in marketing their bonds. Steel Bars have been advanced $1 per ton, making them now 1.35c., base, Pittsburgh, or 1.51½c., Chicago. Steel Hoops, which were 1.25c. rates, Pittsburgh, are now 1.40c., an advance of $3 per ton, making the Chicago price in car lots 1.56½c. rates. Old Materials show no marked changes either upward or downward. Coke is stronger in price and hard to get at any price because of the inadequate carrying facilities of the Coke roads.

Pig Iron.—Pig Iron producers, North and South, have taken a fresh grip on the market and advanced prices from 50c. to 75c. per ton. Just at present they are presenting a very determined front and insist that not a pound of Iron will be sold at less than the prices quoted. They have put Southern on the basis of $10, Birmingham, for No. 2, which means $13.85, Chicago, and Northern Iron on the basis of $14, Chicago, for No. 2. Evidently their customers had been notified in advance that such an increase in price was likely, for a large tonnage has been booked during the last few days, both Northern and Southern. Producers are emphatic in their predictions that the new prices can be held, for the reason that it is now definitely settled what it will cost furnaces to produce Iron, because they believe that the lowest prices on Coke, Ore and labor are already well enough established to prevent any further discounting of possible reductions in these costs. The Pig Iron statement in the last issue of *The Iron Age* has been a source of encouragement to producers, because it demonstrates that while production has been gradually increasing, the consumption has been increasing in a more rapid ratio. Another element that enters into the Pig Iron situation is the fact that hundreds of foundries that have been practically closed down during the winter because of the extremely severe weather are starting into operation and coming into the market for their Iron requirements. Southern Iron has been advanced by the Alabama Consolidated Iron Company, the Tennessee Coal & Iron Company, and doubtless other smaller producers, squarely to the $10 basis, and their representatives here have been instructed to take no business at a less price. At the same time it is not likely that business can be taken at a higher price; so that in our quotations, which follow, we indicate only one price for each of the grades affected. The two large Northern producers have agreed on the $14 basis, and as this represents both minimum and maximum no other quotations are given for the grades in question. If Southern producers can maintain the $10 price, it means an advance of $1 per ton over a week ago, because as late as the middle of last week Iron was sold in the Chicago market on the basis of $9. We quote as follows:

Lake Superior Charcoal	$14.75 to $15.25
Northern Coke Foundry, No. 1	.... to 14.50
Northern Coke Foundry, No. 2	.... to 14.00
Northern Coke Foundry, No. 3	.... to 13.50
Northern Scotch, No. 1	15.00 to 15.25
Ohio Strong Softeners, No. 1	15.30 to 15.80
Ohio Strong Softeners, No. 2	14.80 to 15.30
Southern Silvery, according to Silicon	14.85 to 15.85
Southern Coke, No. 1	.... to 14.35
Southern Coke, No. 2	.... to 13.85
Southern Coke, No. 3	.... to 13.35
Southern Coke, No. 4	.... to 12.85
Southern Coke, No. 1 Soft	13.60 to 13.85
Southern Coke, No. 2 Soft	13.10 to 13.35
Southern Gray Forge	.... to 12.60
Southern Mottled	.... to 12.35
Malleable Bessemer	13.50 to 14.00
Standard Bessemer	15.80 to 16.30
Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon	16.80 to 18.30
Alabama Basic	13.35 to 13.85
Virginia Basic	14.60 to 14.85

Billets.—Prices remain unchanged at $24 per ton, Chicago, for Open Hearth or Bessemer Billets, 4 x 4 and larger, and $25 per ton for Axle Billets and for Forging Billets smaller than 4 x 4.

Rails and Track Supplies.—Somewhat of an increased demand is in evidence from electric railways, and it is rumored that a new Western steam road is in the market for 20,000 tons, although this cannot be pinned down to definite terms. Standard Section Rails remain at $28 per ton, Chicago, and Light Section Rails range from $24.50 to $26, Chicago or Milwaukee. Angle Bars are still quoted 1.40c. to 1.50c., Spikes at 1.70c. to 1.80c., base, while Track Bolts have been reduced to 2.30c. to 2.35c., base, with Square Nuts, and 10c. to 15c. extra for Hexagon Nuts. The prices on Light Rails and on Track Supplies are by no means inflexible, being reduced when necessary to secure business on a competitive basis.

Structural Material.—Producers of this commodity are living on hope rather than on actuality, as the glittering promise of a boom in building which is voiced on every hand has not yet materialized into tonnage. Nearly all conditions seem to be favorable for building activity in Chicago and the West, compared with the almost insurmountable obstacles which have presented themselves in the last two years. Prices are unchanged, as follows: I-Beams and Channels up to and including 15 inches and Angles 3 inches on one leg and larger, 1.76½c., Chicago; Tees, $1 per ton extra. Store prices on Structurals range from 1.95c. to 2c., cut to lengths of 5 feet and over, with occasional lots placed at 1.90c. to meet competition.

Plates.—Makers and sellers of Plates believe they see encouraging indications in the present trend of the market, but no one of them is bold enough to say that business is actually good or that it is much better than it has been for the last two or three months. One indication of strength is that the prices on Nos. 10, 11 and 12 gauge, which are not covered by the Plate Association agreement, are not cut as ruinously as they have been. We quote, carload lots, from mill, f.o.b. Chicago: Tank Steel, ¼-inch and heavier, 1.76½c.; Flange Steel, 1.86½c.; Marine, 1.96½c.; Universal Mill Plate, 1.76½c. to 1.81½c.; 3-16 inch Tank, 1.86½c.; Nos. 7 and 8, 1.91½c.; No. 9, 2.01½c.; No. 10, 1.91½c. to 1.96½c.; No. 11, 1.96½c. to 2.01½c.; No. 12, 2.01½c. to 2.06½c. From store Plates are selling at 2c. for Tank quality, ¼-inch and heavier; 2.10c. for 3-16; 2.15c. for No. 8; 2.20c. for No. 10, with 25c. per 100 lbs. for Flange quality.

Sheets.—Chicago interests do not seem to have been advised of the action taken by the Independent Sheet Association, which was to have been held at Columbus, Ohio, March 9, if it was held at all. The market is in anything but a healthy condition, with every indication that the production is greater than the consumption, and there is a scramble on the part of mills everywhere for sufficient business to keep their organizations together. We repeat last week's quotations with the same comment, that 50c. to $1 per ton or lower than these quotations would be named, according to conditions attending the quotation. We quote as follows, for one-pass Cold Rolled Blue Annealed in the heavier gauges and one-pass Cold Rolled Box Annealed in the lighter gauges, carload lots, base sizes, f.o.b. Chicago: Nos. 9 and 10, 1.91½c.; Nos. 11 and 12, 1.96½c.; Nos. 13 and 14, 2.01½c.; Nos. 15 to 17, 2.11½c.; Nos. 18 to 21, 2.16½c.; Nos. 22 to 24, 2.21½c.; Nos. 25 and 26, 2.26½c.; No. 27, 2.31½c.; No. 28, 2.41½c.; No. 29, 2.61½c.; No. 30, 2.71½c. No changes are noted in prices of Sheets from store, which are as follows: Nos. 8 and 10, 2.15c. to 2.20c.; No. 12, 2.20c. to 2.25c.; No. 14, 2.30c. to 2.35c.; No. 16, 2.40c. to 2.45c.; Nos. 18 and 20, 2.50c. to 2.55c.; Nos. 22 and 24, 2.55c. to 2.60c.; No. 26, 2.65c. to 2.70c.; No. 27, 2.75c. to 2.80c.; No. 28, 2.80c. to 2.85c.; No. 29, 2.95c. to 3c.; No. 30, 3.10c. to 3.15c. Galvanized Sheets are offered at from 80 off to 80 and 2½, Pittsburgh, in carload lots, with an occasional deep cut made that would practically absorb the freight to Chicago. Store prices on Galvanized Sheets remain unchanged at 75 and 7½ to 75 and 10 per cent. discount.

Bars.—The long predicted advance in Steel Bars has come and with it an advance in Hoops still more marked in its character. Steel Bars and Bands have been advanced $1 per ton and Hoops $3 per ton, making the base price on Bars 1.35c., Pittsburgh, or 1.51½c., Chicago, and on Hoops, 1.40c., Pittsburgh, or 1.56½c., Chicago. Bar Iron naturally has been given added strength by this advance in Steel Bars, and the minimum price is now 1.50c., base, Chicago, instead of 1.45c., as last week. Bar Iron generally is being sold on the basis of 1.35c., Pittsburgh, plus full freight to destination, with the exception of Chicago, which is given the arbitrary figure of 1.50c. Store prices also have been advanced, both Iron and Steel Bars now being held at 1.75c., base, from store. Hoops, 2.10c., rates.

Merchant Steel.—The advance in the price of Steel Bars is reflected in Merchant Steel of the Bar class, though there seems to be uncertainty in this market as to just what items belong to this class. This uncertainty will be cleared away doubtless by official communication entering into details which will reach Chicago by to-morrow's mail. At the present moment an advance of $1 per ton seems to have been made on Smooth Finished Machinery Steel, Smooth Finished Tire Steel and Sleigh Shoe, making the revised prices as follows: Open Hearth Spring Steel to the general trade, 2c. to 2.25c.; Smooth Finished Machinery Steel, 1.76½c. to 1.81½c.; Smooth Finished Tire, 1.71½c. to 1.76½c.; Sleigh Shoe, 1.56½c. to 1.61½c.; Cutter Shoe, 2.25c. to 2.35c.; Toe Calk Steel, 2.06½c. to 2.11½c.; Crucible Tool Steel, 6½c. to 8c.; Special Tool Steel, 12c. up; Shafting at 52 per cent. in car lots and 47 per cent. in less than car lots.

Cast Iron Pipe.—No orders of any moment have been taken by the leading producers in this market, although a number of fair sized contracts are being figured on for Oklahoma, Indian Territory and Texas, largely on account of the erection of new water works systems in small growing cities. Prices remain unchanged, as follows: 4-inch Water Pipe, $26; 6 to 12 inch, $25; large than 12-inch, $24, with $1 per ton extra for Gas Pipe.

Merchant Pipe.—A pretty sure indication that Pipe mills are working to their utmost capacity is the fact that nothing is heard nowadays of price cutting on Pipe. The official quotations made by the leading producer, as given below, are being adhered to almost literally by independent mills, and it is performance in the shape of deliveries and

quantities rather than price that carries with it the order in these Piping days of peace. We quote:

	Steel Pipe. Black. Per cent.	Steel Pipe. Galv. Per cent.	Guar. Wr'ght Iron. Black. Per cent.	Guar. Wr'ght Iron. Galv. Per cent.
⅛ to ⅜ inch	66.35	56.35	64.35	54.35
½ inch	69.35	59.35	67.35	57.35
¾ to 6 inches	73.35	63.35	71.35	61.35
7 to 12 inches	69.35	59.35	66.35	56.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—The converse of what has just been said about Pipe applies to Boiler Tubes. Supply is evidently greater than the demand, and in the scramble for business official discounts have only a relative or general bearing on the situation. These discounts are as follows, f.o.b. Chicago, in carload lots:

	Steel.	Iron.	Seamless steel.
1 to 1½ inches	43.35	40.80	53.35
1¾ to 2¼ inches	55.85	38.35	40.35
2½ inches	58.35	43.35	40.35
2¾ to 5 inches	64.35	50.85	up to 4 in. 48.35
6 to 13 inches	55.85	38.35	....

Store discounts on Boiler Tubes remain nominally at least as follows:

	Steel.	Iron.	Seamless steel.
1 to 1½ inches	40	35	37½
1¾ to 2½ inches	50	32½	35
2¾ to 5 inches	60	45	45
6 inches and larger	50	32½	..

Rivets.—The low prices quoted on Rivets, both Boiler and Structural, two or three weeks ago are no longer obtainable. Firms that were then selling Rivets at 1.70c. base, Pittsburgh, now ask 1.80c. The base size of ¾-inch, however, is frequently extended to ⅝-inch.

Old Materials.—Only one change is insisted upon by dealers in this market, and that is an advance of 50c. on short length Old Steel Rails, bringing them up to about the same price as long lengths. There is considerable strength in the market, and railroads seem to have no difficulty in finding purchasers for their Scrap at good prices. The Illinois Central is offering about 3000 tons, 850 tons of which is Railroad Wrought, and other roads have lists out for somewhat smaller tonnages. We quote as follows, per gross ton, Chicago:

Old Iron Rails	$16.50 to $17.00
Old Steel Rails, 4 feet and over	13.00 to 13.50
Old Steel Rails, less than 4 feet	12.50 to 13.50
Heavy Relaying Rails, subject to inspection	23.00 to 24.00
Heavy Relaying Rails, for side tracks	18.00 to 20.00
Old Car Wheels	14.50 to 14.75
Heavy Melting Steel Scrap	11.50 to 12.00
Mixed Steel	9.50 to 10.50

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	17.00 to 17.25
Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	11.75 to 12.25
Shafting	13.50 to 14.00
No. 1 Dealers' Forge	9.50 to 10.00
Wrought Pipe and Flues	8.50 to 9.00
Iron Axle Turnings	8.50 to 8.75
Soft Steel Axle Turnings	8.50 to 8.75
Machine Shop Turnings	7.25 to 7.50
Cast Borings	4.50 to 5.00
Mixed Borings, &c	4.50 to 5.00
No. 1 Boilers, cut in sheets and rings	9.00 to 9.50
Heavy Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	9.50 to 10.00
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00

Metals.—Pig Lead is strong at 4.45c. in 50-ton lots, 4.55c. in car lots, 4.85c. in ton lots or less. Copper is unchanged, 12⅝c. being quoted for Casting and 12¾c. for Lake. Pig Tin is steady at 29¼c. to 29¾c., with spot sales made on the basis of 30c. Spelter sells in car lots at 5c. Sheet Zinc is unchanged at 5.65c. per lb. for car lots of 600-lb. casks and 5.85c. for less than car lots. Old Metals are steady as previously quoted: Copper Wire and Heavy, 11½c.; Copper Bottoms, 10½c.; Copper Clips, 10⅜c.; Red Brass, 10⅜c.; Red Brass Borings, 8⅞c.; Yellow Brass, heavy, 8½c.; Yellow Brass Borings, 6½c.; Light Brass, 6c.; Heavy Lead, 4.25c.; Tea Lead, 4.10c.; Zinc, 3⅝c.; Block Tin Pipe, 24c.; Pewter, No. 1, 19c.

Coke.—The fact that the United States Steel Corporation will require all the Coke produced by the Frick ovens and perhaps a good deal more, coupled with the general quickening in the Iron market and the resumption of scores of furnaces, has led to a stiffening in the price on Furnace Coke, which would now be quoted lower than $1.75 at the ovens only on exceptionally large orders. Foundry Coke also has shared in this revival, both because of the increased demand for Furnace Coke and because foundry operations all over the country are increasing in volume. Strictly 72-hour Connellsville Coke does not seem to be offered by any one in this market at less than $4.90 in carload lots, while some of the producers of better grades are experiencing little difficulty in finding customers in Chicago at 25c. higher. Even at this smelters do not quarrel with the prices, provided they can only get the Coke when they want it. The inconvenience and uncertainty and actual loss due to car shortage by the roads carrying Coke from the Pennsylvania fields seem to become more aggravated each week. The condition is really a serious one. It seems, however, that Cokes from Southern Virginia brought in by the Louisville & Nashville at a rate 40c. lower than from the Pennsylvania field can be ordered with less uncertainty of delivery than from the Connellsville field, and many buyers are turning to the Virginia fields for relief from their troubles.

Philadelphia.

FORREST BUILDING, March 15, 1904.

Sentiment in the Iron and Steel trades has greatly improved, and in some measure it is reflected in actual business. A large amount of Pig Iron has been taken during the past week, and sellers are quoting higher prices, in some cases 25c., in others 50c., but it is easier to quote an advance than it is to find buyers willing to pay it. The situation is such, however, that bids may have to be advanced, and if the demand keeps up it will probably have to be done before buyers can cover their requirements, particularly if they prove to be larger than expected. There is assuredly a great deal more business around than during the previous three months, but whether there is enough to absorb at the rate of nearly 17,000,000 tons of Pig Iron per annum is questionable. The increase in production on March 1, compared with January 1, equals 120,000 tons per week, and while the January output was too low, it is quite possible that the March output will be too large. It may take two or three months to develop this point, however, and in the meanwhile it will be interesting to see how the thing will work out. Theoretically sales are being made at advanced prices, but most of the large lots were taken at the figures ruling for several weeks past, so that the advance, such as it is, is mostly in very small lots, or prospective on large lots. Large blocks of Southern Gray Forge were taken at something less than $13 delivered, and Lehigh and Schuylkill Valley standard brands at about $13.50, but if the demand continues to be active for a few days longer there is little doubt that some advance will be realized, not much perhaps, but enough to show that the market is better. More Iron will be available, however, and it will require a pretty heavy demand to absorb 320,000 tons per week. The outlook is too uncertain to say with confidence what the outcome will be, but the chances are not strong for either advance or decline, the entire situation for the present being contingent on whether consumption will equal the increased supply. It will take a few weeks to test the matter fairly, but in the meanwhile both sides may decide to await developments before commiting themselves to heavy engagements. As regards general business conditions, it cannot be claimed that they are essentially better than expected. At this season of the year more than at any other improvement is naturally looked for, so that there may be no special significance in the present movement. The question to be determined is, How far will it extend? It is not impossible that it may be sufficient to absorb the current output of Pig Iron, in which case business during the remainder of the year cannot fail to be satisfactory, while if consumption fails to reach that point the ill effects of overproduction will again have to be met. Considerations of this character cannot be ignored if the situation is to be carefully studied, and while, as we said before, sentiment is more optimistic than it has been, business is also much better than for several months past, but it is by no means certain that it will reach proportions equal to the provision which has been made for meeting it.

Pig Iron.—Without any distinct change in prices, the market has a firm undertone. Sellers quote an advance of 25c. per ton, and it is not unlikely that the extra 25c. has to be paid to secure good brands of Foundry Iron. Heavy purchases were made earlier in the month at $14.50 to $14.75, delivered, and $14.75 to $15 would be considered inside prices to-day; some indeed ask $15 to $15.25, but buyers are hardly likely to meet these figures unless under special circumstances. Mill and Low Grade Foundry Irons have been heavily bought, but prices were low, ranging from $12.80, delivered, for Southern, to $13.50 for Standard Pennsylvania Irons. An advance of 25c. per ton has been made on the first named, but around $13.50 will still secure first-class brands of the latter. The tone of the market is distinctly strong, however, and if there is a continued good demand during the remainder of the month there is little doubt that to-day's asking prices will become firm selling prices. But it must be remembered that there is an output of 320,000 tons per week, which will require a much larger consumption than there has been during the past five or six months. Some recovery is quite in order, and it is being realized in a very satisfactory manner, but with the present output of Pig Iron there is very little margin for an upward movement. In other words, consumption must not only be maintained at its present level, but it must increase somewhat if the present level of prices is to be maintained. Whether it will do so or not it is quite impossible to say, but time will solve the problem within the next three or four weeks. Meanwhile most of the sales at advanced prices were in small lots, and within

the past two or three days lots of 2000 to 5000 tons have been bought at the low figures ruling two or three weeks ago. All the same, the market is in a condition to give prompt response to an active demand, and it will be of more than ordinary interest to watch developments on the lines suggested. For the present sales have been made at prices within the limits named for city and nearby deliveries, varying according to quantity, brand, proximity to furnace, &c.:

No. 1 X Foundry	$15.25 to $15.75
No. 2 X Foundry	14.75 to 15.25
No. 2 Plain	14.25 to 14.50
Southern No. 2, rail shipment	13.75 to 14.00
Southern No. 2, on dock	13.50 to 13.75
Standard Gray Forge	13.50 to 13.75
Ordinary Gray Forge	12.75 to 13.00
Basic	13.75 to 14.00

Steel.—There is a good demand, and mills have all the business they can comfortably handle. Prices are firm at $24.50 as an inside figure on the best class of business, small lots about $25, delivered. Axle Billets, usual carbons, $25.50.

Plates.—Business is not active, although it is much better than it has been for several months past. Orders are not specially urgent, however, although there is a fairly good run of day to day business. Prospects are favorable and it is expected that a good deal of new work will be on the market in the near future; meanwhile prices are firm as last quoted:

	Carloads. Cents.	Part carloads. Cents.
Tank Steel, ¼ inch and heavier	1.73½	1.78½
Tank Steel, 3-16 inch	1.83½	1.88½
Tank Steel, Nos. 7 and 8, B. W. G.	1.88½	1.93½
Tank Steel, Nos. 9 and 10, B. W. G.	1.98½	2.03½
Flange or Boiler Steel	1.83½	1.88½
Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½
Plates over 100 to 110 inches	.05 per lb. extra	
Plates over 110 to 115 inches	.10	"
Plates over 115 to 120 inches	.15	"
Plates over 120 to 125 inches	.25	"
Plates over 125 to 130 inches	.50	"
Plates over 130 inches	1.00	"
All sketches (excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10	"
Complete Circles	.20	"
Shell grade of Steel abandoned.		

Structural Material.—The expected demand has not materialized to any important extent, although the mills are kept fairly employed. There should be a good deal of work come in within the next few weeks, but in any case there is no reason to fear any shortage, as requirements will be heavy during the spring and summer months. Prices unchanged, as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specification, and small Angles, 1.50c. to 1.55c.

Bars.—The demand for Bars, both Iron and Steel, is said to be so satisfactory that a small advance in prices is confidently expected in the near future. Meanwhile, however, there is no difficulty in getting fairly prompt deliveries, although the mills are reported to have more orders on their books than for months past. Refined Iron Bars quoted 1.43½c. to 1.45c.; Steel, 1.45c. to 1.50c.

Sheets.—Demand very good and capacity of mills fully employed, but without material change in prices.

Old Material.—Some large lots of Steel Scrap have been taken at around $14, delivered, and in some cases at a trifle better. There is a good healthy demand, and while some good judges consider prices as rather "toppy," others are inclined to hold for outside prices. No. 1 Railroad Scrap and Iron Rails command about $17.50; some are firmly held at $18; others, as shown by the following bids and offers for deliveries in buyers' yards:

Old Steel Rails	$14.00 to $15.00
Steel Scrap, light to heavy	13.75 to 14.25
Low Phosphorus Scrap, nominal	18.00 to 19.00
Old Steel Axles	17.00 to 18.00
Old Iron Rails	17.00 to 18.00
Old Iron Axles	20.00 to 22.00
Old Car Wheels	13.00 to 13.50
Choice Scrap, R. R. No. 1 Wrought	17.00 to 18.00
Country Scrap	15.50 to 16.00
Machinery Scrap	13.25 to 13.75
No. 2 Light Scrap	11.50 to 12.00
No. 2 Light (Ordinary)	10.00 to 11.00
Wrought Turnings	9.50 to 9.75
Wrought Turnings, Choice Heavy	10.00 to 10.50
Cast Borings	7.25 to 7.50
Stove Plate	11.50 to 12.00
Wrought Iron Pipe	12.00 to 12.50

Andrew G. Curtin, who has been long identified with the Iron and Steel and Coal trades in the East, has, in connection with his son, Howard K. Curtin, opened an office for the sale of these commodities at 1123 Real Estate Building, Philadelphia, and at 291 Broadway, New York. At the latter office H. J. Curtin will represent the Logan Iron & Steel Company for New York State. The firm, which will be known as Andrew G. Curtin & Son will also represent the Colonial Iron Company for Pig Iron and Timmes & Hecht of Scranton, Pa., for Bar Iron, at both offices.

Cleveland.

CLEVELAND, OHIO, March 15, 1904.

Iron Ore.—The sudden spurt in the Iron and Steel business and the re-establishment of confidence generally throughout the trade have had the effect of increasing the consumption of Ore. Now it is agreed that some of the first estimates of the possible consumption of Ore will have to be revised. Whether this will have any effect upon prices and the agreement of the Ore Association is purely a matter of conjecture all through.

Pig Iron.—The situation in the Pig Iron market has been much improved. The demand for all grades has been better and some of the consumers show, for the first time in months, a disposition to contract for supplies. This feeling has shown itself more in Bessemer Basic, with due amount of attention being paid to Foundry Iron. The smaller consumers of Bessemer, realizing that possibly the supply is not quite so large in the Valleys as it has been generally supposed, are now beginning to contract for their supplies, some of these contracts running as far ahead as July 1. It must be admitted, however, that the larger part of this activity is as yet an inquiry, the Steel Corporation alone having entered the field to buy. Several small Basic orders have been placed, the prices running about even with those on Bessemer—namely, $13 in the Valleys. Foundry contracts are running now about 500 to 1000 tons. Some contracts are being taken at $12.50 to $13 in the Valleys for No. 2 for delivery running up to July 1. Consumers do not seem to be anxious to cover beyond that period and producers are not anxious to sell further ahead than that at present prices. The Coke situation is stronger, there being a shortage of cars with which to move the material. The whole situation is improved. We quote, f.o.b. cars, Cleveland:

Northern Coke, No. 1 Foundry	$13.75 to $14.00
Northern Coke, No. 2 Foundry	13.25 to 13.75
Northern Coke, No. 3 Foundry	12.75 to 13.00
Southern Coke, No. 1 Foundry	14.00 to 14.25
Southern Coke, No. 2 Foundry	13.50 to 13.75
Southern Coke, No. 1 Soft	14.00 to 14.25
Southern Coke, No. 2 Soft	13.50 to 13.75
Jackson County, 8 per cent. Silicon	16.50 to 17.00
Hanging Rock Charcoal, No. 1	.... to 23.45
Southern Charcoal, No. 1	19.50 to 20.00
Lake Superior Charcoal	16.50 to 17.00

Finished Iron and Steel.—The improvement in finished products has continued unabated. Those lines which sank for a while are getting back to normal, and the others are acting as if bottom prices have been reached. The best ordering during the past week came from the Structural Steel trade, which picked up sharply, the aggregate tonnage ranging close to 10,000 tons. The buying of Plates has also continued. The price has held firm at 1.60c., Pittsburgh, with contracting amounting to several thousand tons at that figure. The Bar situation is stiff. The Bar Iron demand has been good, but the price is based more on the high price of Scrap than on any demand that may have been in existence for the material. There has been a fair demand for Rails. One contract is now pending of about 10,000 tons. This and possibly others will be closed in a very short time. The demand comes mostly from the electric lines, which have projects which they are able to finance now. The call for Sheets has been somewhat stronger as the spring season opens. The tendency to cut prices to get business seems to be disappearing. The old list holds of 2.50c. for No. 27 Black Sheets out of stock, 2.35c. for No. 27 one-pass cold rolled in car lots at the mill and 75, 10 and 2½ off list for No. 2 and lighter of Galvanized Sheets out of stock. The Hoop trade has taken a spurt, and deliveries are now hard to obtain. The price has advanced steadily, and is now being quoted freely at 1.40c., Pittsburgh.

Old Material.—The trade is improved, but still lacks strength. Buying is heavier, but hesitating. We quote as follows, all gross tons: Old Steel Rails, $14 to $15; Old Car Wheels, $13.50 to $14.50; Railroad Malleable, $11.25 to $12.25; Heavy Melting Steel, $13 to $14. All net tons: Cast Borings, $5; No. 1 Railroad Wrought, $12 to $13; No. 1 Busheling, $11 to $12; Wrought Turnings, $7.50; Iron Car Axles, $18; No. 1 Cast Scrap, $11.50 to $12; Stove Plate, $9 to $10.

Cincinnati.

FIFTH AND MAIN STS., March 16, 1904.—(*By Telegraph.*)

A general feeling of buoyancy is very apparent in the Pig Iron market, with a condition of activity prevailing such as has not been in evidence for some months. Prices have steadily advanced and the consensus of opinion would indicate there is more to follow. No. 2 Foundry, which last week could be bought for $9.25, Birmingham, is now but a reminiscence and is firm at from $9.50 to $10. Quite a number of small lots ranging from 100 to 1000 tons are being sold, but no very heavy transactions have been recorded. Foundries as a general proposition have not been buying to any great extent, although we note 2500 tons of Nos. 2 and 3 having been sold a concern of this kind. Rolling mills have been in the market for considerable quantities of Iron, as also has the Republic Iron & Steel Company. Firmness of prices characterizes the market and a very

healthful tone is prevalent. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$12.75 to $13.25
Southern Coke, No. 2	12.25 to 12.75
Southern Coke, No. 3	11.75 to 12.25
Southern Coke, No. 4	11.25 to 11.75
Southern Coke, No. 1 Soft	12.50 to 13.00
Southern Coke, No. 2 Soft	12.25 to 12.75
Southern Coke, Gray Forge	11.25 to 11.50
Southern Coke, Mottled	11.00 to 11.25
Ohio Silvery, No. 1	16.15 to 16.40
Lake Superior Coke, No. 1	14.15 to 14.40
Lake Superior Coke, No. 2	13.65 to 13.90
Lake Superior Coke, No. 3	13.15 to 13.40

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$18.00 to $18.25
Lake Superior Car Wheel and Malleable	18.00 to 18.25

Coke.—The Coke market is very active, and, with the demand on the increase, prices are being firmly maintained. We quote from $2.15 to $2.30 on West Virginia and Connellsville, f.o.b. ovens.

Plates and Bars.—The same buoyant feeling that is noticeable in the Pig Iron market is very much in evidence in the Bar market. Prices have advanced somewhat and demand is good. Structural Iron is more active and a general upward trend is looked for. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.40c., with half extras; the same in smaller lots, 1.70c., with full extras; Steel Bars, in carload lots, 1.48c., with half extras; the same in smaller lots, 1.80c., with full extras. Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, 44-inch and heavier, 1.73c., in carload lots; in smaller lots, 2c.; Sheets, 16-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; 14-gauge, in carload lots, 1.95c.; in smaller lots, 2.50c.; Steel Tire, ¾ x 3-16 and heavier, 1.68c., in carload lots.

Old Material.—Conditions are unchanged for this class of material. Demand is very light. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $11 to $11.50 per net ton; No. 1 Cast Scrap, $10 per net ton; Iron Rails, $14 per gross ton; Steel Rails, rolling mill lengths, $11 to $11.50 per gross ton; Iron Axles, $15 per net ton; Car Wheels, $11 to $11.50 per gross ton; Heavy Melting Scrap, $11 per gross ton; Low Phosphorus Scrap, $11.50 to $12 per gross ton.

Pittsburgh.

PARK BUILDING, March 16, 1904.—(*By Telegraph.*)

Pig Iron.—Several good sized inquiries for Bessemer and Basic Iron are in the market, and furnaces have been offered as high as $13.15 at Valley furnace for Bessemer Iron for immediate shipment. We note sales of several fair sized lots at $13.25 to $13.50, Valley furnace. There is an actual scarcity of Bessemer and Basic Iron for prompt shipment, and the market is very firm. It is generally believed that the Steel Corporation will buy at least 40,000 tons more of Bessemer Iron between now and April 10, on which date the option for this Iron at $13, Valley furnace, will expire. The Steel Corporation are urging shipments on the Iron already bought, and the furnaces are making deliveries as fast as possible. The market on Foundry Iron is showing betterment in demand and prices. Most of the Valley furnaces are now quoting on Northern No. 2 $13 at furnace, or $13.85, Pittsburgh. Possibly a few sellers would slightly shade this price. Most of the Southern furnaces hold No. 2 Foundry at $9.50, Birmingham, or $13.85, Pittsburgh. On round tonnage and forward delivery this price might be shaded 25c. a ton. There is more demand for Forge Iron and Northern brands are held at $13.25 to $13.50, Pittsburgh. The whole Pig Iron market is very much stronger and higher prices are freely predicted.

Steel.—While inquiries are light, the general situation is very much improved. The Carnegie Steel Company are operating all of their Steel plants except two to full capacity, and yet are short of Steel for the finishing mills of identified interests of the Steel Corporation. The Carnegie Steel Company and Jones & Laughlin Steel Company are practically out of the market as sellers of Sheet Bars. There is a heavy demand for both Sheet and Tin Bars and the sources of supply are limited. We note sales of about 2000 tons of Bessemer and Open Hearth Sheet Bars at full official prices, and quote Bessemer and Open Hearth Billets at $23, Pittsburgh, while Axle Billets, Open Hearth stock, which run from 0.35 to 0.50 in carbon, are held at $24. Sheet Bars in long lengths take 50c. advance over Billets and $1 advance when cut to lengths.

(*By Mail.*)

The exercising of an option by the United States Steel Corporation for the purchase of 46,000 tons of Bessemer Iron for April shipment, to be bought from the Merchant Furnace Association, but which has since been increased to 49,000 tons; the advance of $1 a ton in Bessemer Steel Bars and the fixing of the price of Cotton Ties by two of the leading mills have been the principal events of interest in the Iron trade since our last report. The total actual purchases of Bessemer and Basic Iron by the Steel Corporation up to this date amount to 144,000 tons, of which 89,000 tons were bought from the Bessemer Furnace Association and 45,000 tons from W. P. Snyder & Co. This Iron is all for March and April delivery. In addition, the Steel Corporation have an option from the Furnace Association for 40,000 tons more of Bessemer Iron, which does not expire until April 10. It is very probable, however, that this Iron will be bought. There are two or three other good sized inquiries in the market for both Bessemer and Basic Iron, and it is said that as high as $13.50, at Valley furnace, has been offered for Bessemer Iron for March shipment. There have been some fairly heavy purchases of Foundry Iron and the market is up fully 50c. a ton. Forge Iron is also in better demand and is held at $13.25 to $13.50, Pittsburgh, an advance of about 50c. a ton. The Steel market is extremely active and some of the finishing mills of constituent interests of the United States Steel Corporation are running short handed for want of Steel. This applies particularly to mills of the American Steel & Wire Company and National Tube Company. Three of the leading Steel mills in the association are well sold up and are not promising deliveries of Sheet Bars inside of four to six weeks. The situation in Finished Iron and Steel is stronger and is reflected in an advance of $1 a ton on Bessemer Steel Bars made yesterday. Unconfirmed reports are that the leading interests may announce an advance in prices of Sheets and Tin Plate at an early date. Prices on Sheets are fairly firm, but on Tin Plate are very strong, some of the outside mills now getting a slight advance for prompt delivery over the figures of the leading interest. Tonnage in Pipe continues very heavy, but in Plates and Structural Steel is only fair. A peculiar feature in regard to the improved demand for Iron and Steel is that it has come without practically any aid from the railroads. The railroads are always regarded as the leading consumers of Iron and Steel products, but for the past four or five months have placed very little tonnage, largely because of inability to negotiate loans. Now that the money market is much easier and money for improvements and new equipment can be raised with less difficulty, it is believed the railroads will soon be in the market as heavy purchasers, and in this event we would have a very heavy demand for products used by them.

The conferences in the past week between officials of American Sheet & Tin Plate Company and the Amalgamated Association have attracted interest, but nothing official has been given out by either side. It is understood that a proposition was made to the Amalgamated Association by the American Sheet & Tin Plate Company that if a 10 per cent. reduction was accepted the Etna Standard Works, at Bridgeport, Ohio, which contains 23 Sheet mills, would be started up. There is no doubt whatever that the wage scale of the Amalgamated Association for Sheet and Tin Plate mills is being violated. Two or three independent Tin Plate mills and several Sheet mills as well are running on a profit sharing basis, which is contrary to the rules of the organization. It is certain that on July 1, the date on which the Tin Plate scale expires, several of the leading independent mills will break away from the organization and will run nonunion.

The whole situation in the Iron trade is showing betterment, and the feeling is more confident than for some months. Several large concerns advise us they have more orders on their books than at this time a year ago, and regard the outlook as very bright.

Ferromanganese.—Reports are going of a contract for 1200 tons of Ferro placed in this market recently, but it has not been officially confirmed. The leading consumers are covered for long periods ahead. We quote English and domestic Ferro at $42 to $43, delivered.

Muck Bar.—There is more inquiry for this product, and best grades of domestic Muck Bar are now held at about $26, Pittsburgh.

Wire Rods.—There are no large inquiries in the market for Rods, but prices are very firm, and we quote Bessemer and Open Hearth Rods at $31 to $32, maker's mill. Several of the Western mills are out of the market as sellers, using their entire product in the manufacture of Wire and Nails.

Steel Rails.—No large contracts are being placed, but it is claimed that tonnage on the books of the mills for 1904 delivery is about 1,200,000 tons. We quote at $28 at mill for Standard Sections.

Railroad Spikes.—Demand is fairly large and local mills have a good deal of tonnage on their books. Prices are firm and we quote at $1.60 to $1.65 per 100 lbs.

Structural Material.—While the outlook for the Structural Steel trade is promising, yet the amount of actual tonnage being placed is not very satisfactory, being confined mostly to small lots. A good many large projects are being figured on, but they develop very slowly. It is officially stated that H. C. Frick will not build a hotel on his Grand street property this year, and the South Side warehouse contract is also held up. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c.

Plates.—While demand for Plates is possibly a little better, yet actual tonnage is not satisfactory, and none of the leading Plate mills is as busy as it would like to be. De-

mand from Boiler shops and small consumers is fairly active, but the large users of Plates, the boat builders and car shops, are placing very little tonnage. Not much business in Plates is expected from the boat building interests this year, but the car shops are figuring on some orders for cars, and the outlook for larger tonnage from this class of consumers is encouraging. The quarterly meeting of the Plate Association will be held in New York early in April. We quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine Ordinary Fire Box, American Boiler Manufacturers', 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches in width, 5c. extra per 10 lbs. Plates 3-16 inch in thickness, $2 extra; gauge Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Sheets.—The meeting of the independent Sheet mills called for Columbus, Ohio, on March 9, was not held, being called off at the last minute. Demand for Sheets is fairly active, but prices are only fairly strong. It is claimed that based on the price of Billets, Sheets are very low, and ought to improve in price before very long. We quote No. 26 Black Sheets at 2.15c.; No. 27, 2.20c., and No. 28, 2.30c., at mill. Galvanized Sheets are now mostly quoted in net prices, which are equal to about 80 and 3 per cent. off. We quote No. 26 Galvanized Sheets at 2.85c.; No. 27, 3.04c., and No. 28, 3.23c. Jobbers charge the usual advances over these prices for small lots from store.

Iron and Steel Bars.—A meeting of the leading Steel Bar mills was held in the Union Club, Frick Building, on Monday, March 14, at which the price of Steel Bars was advanced $1 a ton, or, from 1.30c. to 1.35c. Open Hearth Steel Bars, which heretofore carried an advance of $2 over Bessemer, were not advanced, but remain at 1.40c. The advance on Steel Bars went into effect on Monday, March 14, and it is conservatively estimated that in the past two weeks fully 100,000 tons or more of Bessemer Bars have been placed with the leading mills. Options for a large tonnage at the old price are held by a number of consumers, and it is almost certain that most of this business will be placed. It is safe to assume, therefore, that the Steel Bar mills will enter orders for at least 150,000 tons before this month is out. There is a moderate demand for Iron Bars and the mills have a good deal of tonnage booked. We quote Iron Bars on the basis of 1.30c., Youngstown, or 1.34¾c., Pittsburgh; some mills are quoting about $1 a ton higher. We quote Steel Bars at 1.35c., Pittsburgh, in carloads and larger lots, with the usual differentials for less than carloads. Open Hearth Bars take $1 a ton advance over Bessemer.

Hoops and Cotton Ties.—On Saturday, March 12, two of the leading interests fixed the price of Cotton Ties on the following basis: 75c. per bundle in 3000 bundle lots and over, and 78c. per bundle for less than 3000 bundle lots for March delivery. For April delivery ½c. per bundle extra will be charged, and for each succeeding month or part of a month after April the same advance of ½c. per bundle will apply. A temporary agreement has been made on Steel Hoops, and these are now held at 1.40c., Pittsburgh, for March shipment, but a good deal of tonnage has been placed at slightly lower figures. Quite a heavy tonnage has also been booked for Cotton Ties, and requirements for this year will be larger than last year. The market on Cotton Ties is very firm and higher prices seem likely. Steel Bands remain at 1.30c., extras, as per Steel card.

Merchant Pipe.—The condition of the Pipe trade could hardly be more satisfactory than it is at the present time. Demand is very heavy from all sections of the country, and the leading interest are unable to operate all their mills to full capacity, owing to shortage in supply of Skelp. It is evident the Pipe trade this year will be very much heavier than last year. Prices are firm, discounts to consumers in carloads being as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛, ¼ and ⅜ inch	68	58	66	56
½ inch	71	61	69	59
⅝ to 6 inches	75	65	73	63
7 to 12 inches	71	61	68	58
Extra strong, plain ends, ⅛ to 8 inches	67	57	64	54
Double extra strong, plain ends, ⅛ to 8 inches	59	49	56	46

Boiler Tubes.—Demand for Boiler Tubes from the general trade is quite satisfactory, but from the railroads is only fair. Prices in the main are firm, being shaded only for very desirable orders. Discounts to consumers in carloads are as follows:

Boiler Tubes.

	Steel.	Iron.
1 to 1½ inches	42½	39
1¾ to 2¼ inches	55½	38
2½ inches	58	43
2¾ to 5 inches	64½	50½
6 to 13 inches	55½	38

Tin Plate.—Demand for Tin Plate is quite active, and the mills are entering a heavy tonnage. It is intimated that an advance in prices may be made by the leading interest before long. Several of the independent mills advise us that on orders for Tin Plate for March shipment they are able to get 5c. per box above the official price. We quote 100-lb. Coke Ternes at $3.45 per box, f.o.b. Pittsburgh.

Spelter.—The market on Spelter has eased off to some extent, and Prime Western grades are now held at 4.90c. to 4.95c., f.o.b. Pittsburgh. For future delivery lower prices would be made.

Scrap.—The Scrap market is fairly active, but the principal demand is for Heavy Melting Stock, which is in urgent request. It is held at $14 to $14.25 in gross tons, f.o.b. Pittsburgh. No. 1 Wrought Scrap is $13.50 to $14, net tons; Cast Scrap, $13, gross tons; Rerolling Rails, $15.50 to $16, gross tons; Busheling Scrap, $11, net tons; Old Steel Rails, short pieces, $14 to $14.50, gross tons.

Connellsville Coke.—The Coke trade is very active in demand, especially for Foundry, and last week nearly 500 ovens in the Connellsville region were fired up. Prices on Coke have improved to some extent, strictly Connellsville Furnace Coke being held at $1.65 to $1.75 a ton, at oven, for prompt shipment; 72-hour Foundry Coke is held at $2.25 to $2.50 a ton, at oven. The car situation in the Coke region is very bad, and considerable Coke is piled up, waiting cars for shipment. There are 28,626 ovens in the Upper and Lower Connellsville regions, and of these 21,021 were in blast last week.

The offices of Bole, Ross & Co., dealers in Iron and Steel, Coal and Coke and Pig Iron, have been removed from 1401 and 1402 Park Building, to Suite 311, Lewis Building, Pittsburgh, Pa.

Birmingham.

BIRMINGHAM, ALA., March 14, 1904.

The improvement noted in the Iron market in last week's letter was well maintained during the week just closed. Not only was the demand an increasing one during the entire week, but there was an advance in prices all along the line. The buying was general and of such a character that the advance, when asked, was conceded by the buyer, whose wants were not in all cases fully met. Toward the close of the week some influential buyers hauled out of the market and declined to make any offerings, but contented themselves with considering propositions from the buyers. The sales had been so free that they took a recess to find out just where they stood in the matter of sales as compared to anticipated output. In some cases they showed that a policy of conservatism in regard to further sales was demanded by ordinary business prudence. So the offerings of Iron dropped off considerably and buyers then became all the keener to get the Iron. There were some buyers in the market who were after lots of magnitude who had been prodding for some days for soft spots. They all got in, but the terms have been carefully guarded and the real figures of more than one purchase have been carefuly withheld from publicity. Indications point to $9.25 as the base price for No. 2 Foundry, in some instances, while others had to pay on the basis of $9.50 for that grade. As stated above, the character of the buying was general. All the various interests were in the market, and it was a seller's market all through the week. It commenced with some interests firm on the basis of $9.50 for No. 2 Foundry and it ended with some firm on the basis of $9.75; and, in a few cases, some were firm on the basis of $10 for that grade. But where the latter prevailed it was because sales had been made of such magnitude that the sellers were practically out of the market, pending an investigation as to where they stood. Better than $9.50 for No. 2 Foundry was done at the close of the week, and there was more or less business turned down for the simple reason that sales were in amount all that the sellers thought it prudent or safe to sell. Knowing of the heavy sales made, your correspondent has been at pains to obtain an approximate idea of the sales made during this buying activity, dating from the first of the month, and places them in that time at full 200,000 tons. Conservative interests in the trade regard this estimate as within actual limits.

Your correspondent saw numbers of orders for No. 2 Soft at $9.25 that were turned down, and also saw a number of orders that were registered at $9.50. There were cases of sales at above $9.50 that were also accepted. The Soft grades seem to be in light supply, and a slight advance in the selling price was obtained with but little opposition when asked. No. 3 Foundry was in fine demand and readily brought $9. There was a good deal of sparring about the price of Gray Forge, and those who waited for a decline had to pay, in frequent cases, an advance. Buyers frequently had to pay $8.50 for Gray Forge, though some who were in early in the week for that grade secured their requirements at $8.25. Basic Iron has advanced to the front again and now is relatively high. It is not easy to obtain

it, and if one secured any of it below $10 he could count himself fortunate. The way the market has been running here for the past week or ten days the conclusion is irresistible that buyers' necessities have been greater than the sellers estimated them. The sales have been following the lines frequently mentioned of late, which restricted deliveries as to time. But there has been some departure from that policy, and sales for delivery into the third quarter have been materially increased. The price for this advanced delivery is withheld, though the general opinion is that about 25c. will closely approximate it. With as much business carried over and declined as the records show, the inference is that the activity will be continued for a while longer. A few sellers have confined themselves to selling their make to as near 30 and 60 days as they could, anticipating still further advances as the year grows older.

A trip was made to Ensley last Friday to note the improvements that had been made and to witness the character of the work being done. The improvements installed have added wonderfully to the efficiency of the plant, adding not only to its efficiency relative to character of the production but greatly minimizing the cost of product turned out. They are now rolling about 750 tons of Steel Rails per day, and in that neighborhood of Steel Billets. The Rails submitted for delivery have been subject to crucial tests, and have in every instance successfully borne them. With this reputation for character of product turned out, there will be no lack of orders offering to keep them going. Further improvements are in contemplation; and one could say are actually under way—and all tending to make the mill a model "all around mill." Concerning the consolidation measure, there is nothing to say. The job of the experts includes the examination of over 400,000 acres of land in this State and of 150,000 acres in other States. This is a task of magnitude and will take time. Nothing has leaked out here concerning probabilities, because there is nothing yet to leak.

The Decatur Car Wheel Works have, it is understood here, secured the contract for supplying the Gulf & Ship Island Railroad for the next 12 months.

The casting of the Iron figure of Vulcan, to be exhibited at the St. Louis Fair, has been commenced and partially completed.

J. B. McClary & Co., Birmingham, Ala., have established themselves in the First National Bank Building, Birmingham, Ala., as manufacturers' agents for the sale of railroad, mine, furnace and electric railroad supplies. Mr. McClary has been manager of the Birmingham Street Railroad for the past 15 years, prior to which he was connected with different Coal and Iron companies in the Birmingham district.

New York.

NEW YORK, March 16, 1904.

Pig Iron.—Some of the leading consuming interests in this section have taken round lots during the past week and others are in the market. There is a firmer feeling, and asking prices have been generally advanced. A little more money is being paid than some time since, when prices were at their lowest. We quote: Northern No. 1, $15.25 to $15.50; No. 2 Foundry, $14.50 to $15; No. 2 Plain, $13.50 to $13.75, and Gray Forge, $13 to $13.50, tidewater. Tennessee and Alabama brands are quoted $13.50 to $13.75 for No. 2 Foundry and $13 to $13.25 for No. 3 Foundry.

Steel Rails.—The market continues exceedingly quiet, the only large sale reported being one of 8000 tons by an Eastern mill. We continue to quote $28, delivered, for Standard Sections.

Cast Iron Pipe.—The volume of business is fairly satisfactory, foundries being able to secure enough new orders to balance their shipments. The lettings immediately in sight do not include any notable quantities. One matter of great importance which is now being seriously considered by the municipal authorities of New York will involve the consumption of a very large quantity of Pipe if it should be approved. This is the construction of Pipe lines throughout the city for the purpose of enabling the Fire Department to use salt water from the adjacent rivers to extinguish fires. The plan as at present contemplated would compel the use of about 80,000 tons of Pipe for New York and 20,000 tons for Brooklyn. It is quite confidently expected that the Brooklyn end of the project may be carried through, even if the New York portion should be deferred. The competition is sharp for quantities of any size, but carload lots are still quoted at $28, per gross ton, for 6 to 10 inch, and $27 for 12-inch upward, at tidewater.

Finished Iron and Steel.—Structural work is not developing among the railroad companies as had been hoped, but some business is assuming shape which may shortly take the form of orders. An interesting feature of this branch of work, however, is the appearance of an enlarged demand from manufacturing companies for buildings for manufacturing purposes, as well as improved appliances requiring Structural work. The business thus coming forward, however, has not thus far run into large tonnages. The Structural contracts of all kinds for the past week which have been placed in this locality, would amount to considerably short of 10,000 tons. Now that the Pennsylvania Railroad tunnel contracts have been placed, greater interest is being shown relative to the materials which will have to be purchased, 25,000 tons of Plates being required. This order is expected to be placed shortly. Inquiries are out for 1000 tons of Plates for the new ferry boats to be built for the city. The demand for small lots has not been so active. The Bar Iron trade is very good, buyers having been prodded by the very cheerful reports from the West and the $1 per ton advance in Steel Bars. Sellers report business coming very easily. We quote, at tidewater, as follows: Beams, Channels, Angles and Zees, 1.74½c. to 2c.; Tees, 1.79½c. to 2c.; Bulb Angles and Deck Beams, 1.84½c. to 2.05c. Sheared Plates in carload lots are 1.74½c. to 1.85c. for Tank, 1.84½c. to 2c. for Flange, 1.94½c. to 2.10c. for Marine and 1.94½c. to 2.50c. for Fire Box, according to specification. Common Bar Iron, 1.35c. to 1.40c.; Refined Bars, 1.44½c. to 1.50c.; Soft Steel Bars, 1.49½c.

Old Material.—The situation is quite complicated at present and by no means satisfactory to either buyers or sellers. It had been expected that by this time the supply would be increased owing to the better weather, but railroad companies are now impressed by the improvement in the Iron trade and are holding their accumulations for better prices. The consumers are in need of more or less material, but they are by no means disposed to bid prices up and are therefore backward in making commitments. Under the circumstances it is quite difficult to quote prices. A lot of a few hundred tons of Old Steel Rails was sold for rerolling at $13, delivered at buyer's mill. As far as can be ascertained, prices are somewhere in the vicinity of the following quotations, per gross ton, at New York:

Old Iron Rails	$16.00 to $16.50
Old Steel Rails, long lengths	13.00 to 13.50
Old Steel Rails, short pieces	11.00 to 11.50
Relaying Rails	17.00 to 18.00
Old Car Wheels	11.50 to 12.50
Old Iron Car Axles	18.00 to 18.50
Old Steel Car Axles	14.00 to 15.00
Heavy Melting Steel Scrap	11.00 to 11.50
No. 1 Railroad Wrought Iron	15.00 to 15.50
Iron Track Scrap	14.00 to 14.50
Wrought Pipe	10.00 to 10.50
Ordinary Light Iron	7.00 to 7.50
Cast Borings	5.00 to 5.50
Wrought Turnings	8.00 to 8.50
No. 1 Machinery Cast	11.50 to 12.00
Stove Plate	9.50 to 10.50

Trade Publications.

Taylor's Spiral Riveted Galvanized Pipe.—The American Spiral Pipe Works, 1173 to 1201 South Paulina street, Chicago, issue an illustrated circular showing varied purposes to which their riveted pipe is adapted, special attention being paid to its use for exhaust steam. It can be furnished cut to length and flanged, complete with fittings, in accordance with blue prints. The company recommend it for all high pressure hydraulic work, especially for mining, power development and water supply lines.

White Lead.—The Picher Lead Company of Joplin, Mo., manufacturers of sublimed white lead, have issued a 16-page booklet entitled "The Story of Picher Sublimed White Lead." The first three pages comprise the inventor's prologue, while the remaining pages are devoted entirely to the "story," which tells of a zinc oxide manufacturer's inspiration as to the possibility of making white lead by sublimation. The booklet is attractively illustrated and will prove of interest to all users of white lead.

Water Meters.—The latest catalogue from the Pittsburgh Meter Company, East Pittsburgh, Pa., is an attractive exposition of the Keystone water meter, which gives first a word as to the utility of such an instrument, followed by a well illustrated description of its construction and action. Complete tables of sizes and dimensions are included, with instructions for reading the registers. Other features which are described are dial extensions, whereby the meters may be placed below the surface of the ground and the dials projected to a point where they may be inspected; fish traps; a meter prover for testing meters, and detailed illustrations of the various parts, with an accompanying table of numbers and names.

Blowers and Exhausters.—The Indiana Fan Company, 400 South Meriden street, Indianapolis, Ind., have recently issued catalogue No. 30, describing the Indiana volume blower and volume exhauster, and the No. 00 blower, for laundries, forges and similar service. The fans are furnished with self oiling, self aligning dust proof boxes, having phosphor bronze bearings. A special feature is made of the construction of the box, which is illustrated and described in detail, and brief mention is also made of the New Triumph exhaust fans, with either flat or propeller wings.

Brick Drying.—Waste heat drying apparatus is the subject of catalogue 159 from the American Blower Company, Detroit, Mich. It contains some 78 pages and is replete with valuable information on this special class of work. Besides an account of the A B C system and its advantages, considerable space is given to an illustrated discussion of the equipment, even going into details of the various parts of the blowers and engines.

Causes of the Darlington Hotel Collapse.

H. de B. Parsons, who has been retained by the District Attorney's office of New York to investigate and report upon the causes of the collapse of the Darlington Hotel, on Forty-sixth street, New York, has completed his investigations and has practically compiled his report. The report will summarize the causes of the collapse as follows:

The primary causes for the failure of the structure were faulty design and carelessness and neglect in the erection of the members. The actual cause of the collapse was the lack of lateral support for the columns, which permitted them to act as "long columns"—that is, the ratio of length to least radius of gyration exceeded the limit for safety. Going into details, the report will say:

Construction.

The building was being constructed on the "cage" system—that is, all the weight was supported on the columns. The outside walls were of brick and partly concealed the outside row of columns. The columns were of cast iron, with end flanges and with side brackets and lugs cast on near the top to carry the girders. The columns were all of rectangular section, generally varying from 9 inches square by 1 inch thick in the basement to 6 inches square by ¾ inch thick on the upper floors. Each column had top and bottom flanges cast only on the north and south sides, and each flange had two bolt holes. The girder and floor beams were of steel. The girders generally ran east and west across the building, and were supported on the brackets cast on the columns and bolted to the lugs with two bolts at each end; the beams generally ran north and south, and were bolted to the girders by double clip angles, with two or three bolts through each leg of the angles. The floor members were all of rolled sections (I's and channels), and were marked "Phoenix" and "Carnegie."

The floor arches were made of cinder concrete laid up on the Roebling system. The spans were variable, averaging from 4 feet 6 inches to over 5 feet. The thickness of the arches could not be determined, as they were all destroyed. The building was to have been 12 stories and basement in hight, with a penthouse on the roof.

Observations.

On collapsing the building fell downward, with a leaning to the north—that is, toward the rear. Practically all of the material fell inward except a relatively small amount, which fell over the rear wall against and into the Hotel Paterson.

The columns in the outer wall broke off with approximate uniformity between the second and third floors, although the floor systems of the stories below and the interior columns (except some in the basement) were carried away, leaving the outer columns standing from their foundations to the points of rupture. The columns showed by measurement to have variations as to thickness of metal on the opposite side of ⅛ inch or less.

In the great majority of cases the columns broke off at the flanges, leaving one or both of the flanges bolted to the corresponding flange of the adjacent story column. A few of the columns were broken at or near the center. There were no ribs cast on to stiffen the flanges, nor any for the lugs except in special cases. The column ends were plain. No shims were found between the flanges. The holes in the column flanges were drilled 13-16 and ⅞ inch in diameter. The bolts were ¾ inch, and some were loose. The holes in the lugs for the beam ends were cast about ⅞-inch diameter. The bolts were ¾ inch.

The fractures in the body of the cast iron columns exhibited fairly good metal. The flange fractures exhibited blowholes and honeycombing in many instances (about 15 per cent. were honeycombed, about 25 per cent. were defective and about 60 per cent. were fair to good). The rolled steel members of the floor systems were twisted and bent. The steel gave evidence of being good material, and the bolts held well. A number of pieces of I's and channels were taken out of the *débris* which from the appearance of the bolt holes had never been erected. Such pieces were marked for use on the tenth, eleventh and twelfth floors. They were found near the top of the ruins near the rear.

The concrete from the floor arches was weak and readily broken. It gave the appearance of lack of cement and having been frozen.

The foundations under the walls and interior columns were found true and level. The cast iron footings under the columns were in place and unbroken. The soil under the column bases was clay in every instance, where dug up both in front and back of the lot. The bases had an area of 10 feet square, or amply sufficient to have sustained the load intended. Rivets were not used. All members were bolted. There were no diagonal braces, corner braces, or any special means used to provide lateral stiffness against wind or side pressure. The columns were held in their vertical positions by the friction of the floor systems on the broken brackets.

Cause of Fall.

Practically the building was pin connected. The bolts fastening the girders and beams against the column lugs, were of smaller diameter than the holes, so that the columns received little or no lateral support. The column lengths were bolted together at top and bottom, and acted as continuous columns. All loads were eccentrically supported on the side brackets. In consequence, the columns were too long to carry the superimposed weight and buckled. One column situated at or near the "center of fall" broke. The upper parts of this column being deprived of its support fell, and pulled with it the floor members bolted to it. Each of these floor members pulled over the adjacent columns to which the other ends were attached, and these columns having no lateral support broke at the lower flange, as the pull had a lever arm of about 10 feet, or the length of the column. This action and reaction of the stresses affected only the structure above the level of the original fracture. In fall, the mass of material from above crashed down and broke that part of the structure below the level of the original fracture.

The exterior columns did not break off as low down as the interior columns, because the mass fell away and did not crush them as it did the interior ones. The uniformity in hight at which the exterior columns broke strongly indicates that the primary fracture occurred at or about the level of the fourth floor.

Design.

The design was faulty in failing to provide any lateral stiffness. Wind bracing or its equivalent should always be provided in a structure intended to be nearly 150 feet high. As the upper end of each story column furnishes the base for the support of the next story column, each column head should have been given positive support in the design, and the design should not have trusted to the friction of floor members or to that stiffness which might have been afforded by a floor arch.

Cast iron columns having a thickness of ¾ inch should not have been designed for a basement of a 12-story building. This material is so uncertain as to blow holes and honeycombing, when delivered from the ordinary foundry, as to require a greater thickness. The design should have provided ribs for the flanges, since these flanges are apt to be weak from the collection of air bubbles as ordinarily cast.

Erection.

During erection the errors in the design should have been noticed and corrected. It was carelessness and neglect that overlooked the lack of lateral stiffness, which must have made itself apparent when the parts were being framed together. Furthermore, it is hardly conceivable that in a structure so cheaply built as was the Hotel Darlington the members could have fitted so true as not to require some shims between the column flanges. As no shims were found there naturally exists a suspicion that the columns were not truly set in their places, which would account for the slackness of some of the bolts found.

The Goulds Mfg. Company, Seneca Falls, N. Y., have opened a branch office for the sale of their power pumps at Pittsburgh, Pa. The office is in the new Bessemer Building, Sixth street and Duquesne way. E. M. Wag-

ner, who has long been identified with the power pump business, will be in charge. O. D. Hogue has been placed in charge of their power pump sales department at 81 Milk street, Boston. This office is now in temporary quarters, but will be permanently located at 8 Oliver street as soon as the building is completed.

Iron and Industrial Stocks.

The market for industrial stocks has been inclined to quietness during the greater part of the week, as speculation was waiting upon the Northern Securities decision. Even the declaration of a 2½ per cent. dividend on Can preferred and buoyant reports from the iron trade had very little effect. The decision was handed down on Monday, and, although it was adverse to the Northern Securities Company, and the logical deduction would be that stocks should go lower, they advanced all along the line. The explanation given is that speculators had overreached themselves by too heavily selling stocks short in anticipation of a decline, and partly because the Administration disavows an intention to follow up the decision by attacking other corporations of the same general character. The most important advances were in United States Steel, Tennessee and Colorado stocks. The lowest and highest points on these stocks up to Tuesday evening were as follows: Steel common 10½ and 11¼, preferred 55⅛ and 56⅞, new 5's 72 and 72⅛; Tennessee 35 and 37¾; Colorado 25½ and 29. The last reported sales of active stocks up to 1.30 p.m. on Wednesday were as follows: Car and Foundry common 19¾, preferred 71; Locomotive common 22¼, preferred 82¾; Colorado 29; Pressed Steel common 29½, preferred 70; Railway Spring common 23, preferred 71¾; Republic common 7½, preferred 42¼; Sloss-Sheffield common 39½, preferred 80; Tennessee 38¼; United States Steel common 11⅛, preferred 57, new 5's 73.

Dividends.—The Westinghouse Air Brake Company of Pittsburh have declared the regular quarterly dividend of 2½ per cent. and an extra dividend of 2½ per cent., the latter being a reduction of 1 per cent. over previous extra dividends. John Caldwell, treasurer of the Westinghouse Air Brake Company, explains the reduction in the extra dividend as follows: "The extra dividend has always been regulated in accordance with the earnings of the company for the quarter for which the dividend is declared. As is generally known, there has been a falling off in the building of new railway equipment, as well as in other branches of business, and this accounts for the reduction in the extra dividend from 3½ to 2½ per cent." The quarterly dividends paid during 1899 were 5 per cent. regular and 5 per cent. extra; in 1900, 2½ per cent. regular and 5 per cent. extra; in 1901 and since, 2½ per cent. regular and 3½ per cent. extra until now.

American Smelting & Refining Company have declared the regular quarterly dividends of 1¼ per cent. on the common stock, payable April 20, and 1¾ per cent. on the preferred stock, payable April 5. Books for common stock close April 5 and reopen April 21; preferred stock close March 23 and reopen April 6.

Tennessee Coal, Iron & Railroad Company have declared the regular quarterly dividend of 2 per cent. on the preferred stock, payable May 2.

American Iron & Steel Mfg. Company have declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable April 1.

The regular quarterly dividend of 1 per cent. on the common stock of the International Steam Pump Company will be paid April 1. Books close March 21 and reopen April 2.

American Can Company have declared a dividend of 2½ per cent. on the preferred stock, payable April 1. Books close March 22 and reopen April 1.

Otis Elevator Company have declared the regular quarterly dividend of 1½ per cent. on the preferred stock, and a quarterly dividend of 2 per cent. on the common stock, both payable April 15. Books close March 31.

Westinghouse Air Brake Company have declared a quarterly dividend of 2½ per cent., and an extra dividend of 2½ per cent. Books close April 1 and reopen April 11.

Metal Market.

NEW YORK, March 16, 1904.

Pig Tin.—Aside from a slight decline in the prices of spot and a little stiffening on futures, there is no change from the conditions of last week. Deliveries have been made with fair promptness, but have not yet reached as large a total as usual. There is little interest shown in the market either from a consuming or speculative standpoint, although in the early portion of the week more activity was displayed. Prices to-day are as follows: Spot, 27.75c. to 28.10c.; March, 27.70c. to 28., and April, 27.50c. to 27.80c. The London market has advanced to £126 2s. 6d. for spot and £126 for futures. The arrivals thus far this month have aggregated 2636 tons, and about 3047 tons are afloat.

Copper.—The market is still extremely dull, with prices unchanged. Transactions are scarce, and when made are so small that it is difficult to form a fair idea of the actual condition of prices. The "official" prices of the large producers remain unchanged at 12.50c. to 12.75c. for Lake, and 12.37½c. to 12.62½c. for Electrolytic and Casting. Merchants and brokers who are fortunate enough to secure small orders are willingly shading these prices ⅛c. In large lots there is a total absence of business. The London market has advanced to £57 5s. for spot, £56 5s. for futures, and £60 for Best Selected. Exports still continue on a large scale, amounting to 11,000 tons for the first half of the month.

Pig Lead—Is firm and unchanged as to price. Holders of spot in store here are commanding 4.60c. to 4.65c. The quotations of the American Smelting & Refining Company are still based on 4.50c. for 50-ton lots of Desilverized, shipment within 30 days. St. Louis telegraphs 4.45c., and the London cables announce a slight decline to £11 18s. 9d.

Spelter.—The market is quiet and prices are practically unchanged. Spot is quoted nominally 5c. to 5.10c., while St. Louis telegraphs 4.80c., and London has gone up a shade to £22 5s.

Antimony.—The market is firm, but unchanged. At the close to-day Cookson's was quoted at 7¾c. to 8c.; Hallett's at 7¼c. to 7½c., and other brands at 6¼c. to 6½c.

Nickel.—This metal is firmly held, with the usual volume of business passing. Large lots are quoted at 40c. to 45c., and smaller quantities at 50c. to 60c.

Quicksilver.—The tone of the market is steady. Flasks of 76½ lbs. are quoted at $47 to $47.50. London quotes £8 5s.

Tin Plate.—The demand for Tin Plate is very quiet, and the market as a whole presents a dull appearance, transactions being of an ordinary type, and the outlook not very favorable. Quotations, meanwhile, are unchanged on the basis of $3.45 per box for 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to $3.64, New York. At Swansea the market is unchanged at 11 shillings 1½ pence.

We are indebted to L. Vogelstein of 90-96 Wall street, New York, American representative of Aron, Hirsch & Sohn, Halberstadt, Germany, for the following figures showing the German consumption of foreign Copper for the month of January, 1904, compared with the same period of 1903-1902:

	1904. Tons.	1903. Tons.	1902. Tons.
Imports	9,391	6,829	9,705
Exports	676	795	1,482
Consumption	8,715	6,034	8,223

There is no doubt whatever but that affairs in the Amalgamated Association have reached a crisis, and it will require very rare diplomacy on the part of the officials to keep that organization in existence. Whatever strength the Amalgamated Association has is in the sheet and tin plate mills, and it has recently lost a number of these. The Muskingum Valley Steel Company, with sheet mills at Zanesville, Ohio; the Parkersburg Iron & Steel Company, Parkersburg, W. Va., and the Carnahan Tin Plate & Sheet Company, at Canton, Ohio, are all running their sheet mills under private arrangements with the men and contrary to the rules of the Amalgamated Association. The Alcania Tin Plate Company of Avonmore, Pa.; the Standard Tin Plate Company of Canonsburg, Pa.; the Canonsburg Steel & Iron Works, Canonsburg, Pa., and one or two other union tin plate mills are all operating their plants on a co-operative basis, by which part of the earnings of the men are deposited with the company under certain conditions. Unless the operations of the plants show a certain profit the employers retain the money deposited by the men, but if the earnings justify it the money deposited by the men is returned to them. The situation has become so serious that a call has been issued for a meeting of the Executive Board of the Amalgamated Association, which is to be held in Pittsburgh on Thursday, March 17. At this meeting the present crisis in the affairs of the association will be thoroughly discussed. We may state that a number of the leading sheet and tin plate concerns who now work under the Amalgamated scale will break away from that organization on July 1, when the present scales expire.

We are advised that the fire at the Carlisle plant of the Standard Chain Company, at Carlisle, Pa., was not serious, the loss being $6000 to $7000, about 75 men being thrown out of employment. The plant will probably be rebuilt as soon as the insurance is adjusted.

The New York Machinery Market.

NEW YORK, March 16, 1904.

Several transactions of considerable importance to the machinery trade form a part of the business history of the week. Their good effect upon the market should extend into the future and hasten the resumption of activity in the machinery field. The most important of these, and by far the most important contracts awarded in this market in many a day, were those given by the Pennsylvania Railroad for the construction of their tunnels from Jersey City, N. J., underneath the Hudson River, Manhattan Island and the East River to Long Island City, New York. As told in another column, the work was given out in two contracts, the one including the Hudson River work going to the O'Rourke Engineering Construction Company of 26 Cortlandt street, New York, and the one for the East River section being awarded to S. Pearson & Son, Limited, of London. It is announced that the latter concern will open offices in New York shortly. At present their New York correspondents are Carr Bros. of 61 Broadway. Both concerns are now actively engaged in making preparations for the starting of work. This, of course, means the preparation of lists of machinery equipments required in the performance of the contracts, and there will be a much larger quantity of this than is generally thought. While an estimate approaching accuracy cannot be made as yet, we are advised at the office of the O'Rourke Company that their requirements along this line will aggregate between $500,000 and $1,000,000 in value. Large plants will be constructed at each end of their section, as the work is to progress simultaneously from both ends toward the middle. As the work advances a great deal of additional machinery will be required. While we have no authoritative information on the subject, it is generally taken in the trade that the Pearson firm will require a similar amount of equipment for the carrying out of their contract.

Now that the construction contracts have been let, the power plant supply trade are anxiously awaiting developments in the direction of specifications for the equipment of the power stations. As we have previously noted, there will be one station at the Jersey end and another at the Long Island City mouth of the tunnel. These stations have been designed by Westinghouse, Church, Kerr & Co., and it is taken for granted, of course, that a large portion of the equipment will be furnished by the companies allied with the Westinghouse interests. There is an immense quantity of materials, including the boilers, however, which are not included in the line of manufacture of the Westinghouse companies. It will be recalled that the contracts for a portion of the equipment of the Long Island City station have been awarded. This is not for the operation of the tunnel, but is to be used in connection with the electrification of the Long Island Railroad. For the electrical haulage of the trains through the tunnels the Long Island station will have to be enlarged several times over, and a station, generating about 50,000-kw., will be built at the New Jersey end of the tubes. Large orders for electric locomotives of a very powerful type will also be placed in this connection.

Builders of power generating apparatus are also paying close attention to the Brooklyn Rapid Transit-New York Edison interests. As we have previously stated, specifications are out for a monster power station to be built by the Brooklyn Rapid Transit Company adjoining their Kent avenue station. Bids are now being received, and it is expected that awards will be made in about a month. Specifications for the new station to be built by the New York Edison Company have not been issued as yet.

Plans for the large new station to be built on the Hackensack Meadows by the Public Service Corporation of Newark, N. J., are also being held in abeyance for the present.

In the machine tool trade two large deals were closed. One of these runs more heavily into money than anything that has been decided in the machine tool market for some time past. It was the award of about $145,000 worth of boring mills to the Niles-Bement-Pond Company by the General Electric Company. There were 13 machines in the lot and they were all of very heavy design, running up to 14 feet in size. We are informed that the machines are to be used in the company's new turbo-generator department at Schenectady. The Niles boring mills already form a large part of the equipment of this department, as some 20 machines similar to those just ordered have been previously installed. The awarding of this contract is regarded with considerable significance in the trade. It is now hoped that the General Electric Company will loosen some of the strings that have been holding back the orders on the large general machine tool list which was issued several months ago and on which no purchases have been made as yet.

Orders have been placed by the Power & Mining Machinery Company, 52 William street, New York, for the machine tool equipment for the extensions to their shops at Cudahy, Wis. The list, which was printed in these columns February 11, covered tools amounting to about $80,000 and included boring mills, planers, drilling machines, shapers, milling machines, lathes, &c. There were 22 lathes in all, and the order for them was secured by W. H. Foster. New York. Exclusive of two or three machines, the order for the balance of the equipment was placed with the Niles-Bement-Pond Company. The Power & Mining Machinery Company have lately taken a number of important contracts, including two 200 horse-power Crossley gas engines for the Avino Mining Company, Mexico, and a 300 horse-power Crossley gas engine for the Salesville Bleacheries, Salesville, R. I.

The Southern Railway Company have about completed the improvement to their shops at Atlanta, Ga., and the equipment for the new additions has been purchased.

That matters concerning the construction of the new Canadian Westinghouse plant are progressing favorably is evidenced by the fact that the company have just awarded the contract for the structural iron and steel work to be employed in the buildings. Reinforced concrete will be extensively employed in the construction of the various buildings, and while no details can be obtained at this time to indicate the size of the plant, we are informed that about 750 tons of structural material comprised the order referred to. Nothing has been given out as yet as to the present status of matters pertaining to the machinery equipment to be installed.

The Goubert Mfg. Co. of 85 Liberty street, New York, who as we have previously noted have entered upon the construction of large new machine shops and foundries at Bayonne, N. J., are now taking up the subject of machinery equipment. At present they are only receiving bids on the power plant apparatus, electric traveling cranes and foundry appliances. The equipment of the machine shops, it is thought by the officers of the company, will be deferred until the buildings are completed, and the equipment which they have in their present plant has been placed in position in the new works. That a considerable amount of new machinery will doubtless be ordered when the subject is considered is intimated, as the company state that they intend branching out into new lines of manufacture. Details as to this statement are not given out at present, although the general impression prevailing in the trade is that additional steam specialties to those produced by the company at present are referred to. For the power station the company propose purchasing a 300 horse-power direct connected compound engine, to be run noncondensing. Four traveling cranes will be purchased, ranging from 15 to 40 tons in capacity. The foundry equipment will include all of the modern appliances for a plant of 50 tons daily capacity. There will be four cupolas. This end of the business is to be in charge of D. G. Moore, formerly of the Crescent Iron Works of Elizabethport, N. J.

The contracts for the complete equipment of the new power station to be built at Chambersburg, Pa., by the Chambersburg & Gettysburg Electric Railway Company, were awarded to the Washington Company of 39-41 Cortlandt street. They have sublet the contract for the engines to the Hooven-Owens-Rentschler Company, and will install Franklin water tube boilers.

The Hazelton & Donald Machine Company, 612-614 Discount place, Philadelphia, Pa., who were recently incorporated, have taken over the plant and business started some 18 months ago by Fred. D. Hazelton and Andrew Donald under the firm name of Hazelton & Donald. The firm are already well known in the machine trade as the manufacturers of the Acme metal saw table and Acme bench hand tapper, the former being a very efficient machine for sawing sheet, rod and tube brass and copper. The new company will put on the market a new testing outfit, consisting of a surface plate, straight edge and angle plate, a new universal jig fixture and later on some larger tools. The general jobbing business will be continued by the company, but with better facilities. Fred. D. Hazelton was for a long time associated with the Garvin Machine Company, New York, and previous to that with the Becker-Brainard Milling Machine Company, Hyde Park, Mass.

The Martin Hardsocg Mfg. Company, Allegheny, Pa., will shortly be in the market for various equipment for their new plant. It will be remembered that their plant was destroyed by fire early in the winter, and that it was noted in these columns some time ago that they would rebuild as quickly as possible, and would require considerable new equipment. We are now informed that plans are ready and that rebuilding will be commenced at once. The company manufacture mine tools and drills.

A project that will necessitate the purchase of a large amount of sugar making machinery, engines, boilers, pumps, &c., is being rapidly developed by the Metropolitan Sugar Refining Company, who were recently organized with a capital stock of $5,000,000. The company have purchased a site at Weehawken, N. J., where they are to erect a large sugar refinery, plans for which are being prepared by the George M. Newhall Engineering Company, 136 South Fourth street, Philadelphia, Pa. The Newhall Company have the contract for the erection and installation of the entire plant, and all equipment will be contracted for through their offices.

The $188,700 provided for the Charlestown Navy Yard by the urgent deficiency bill will be devoted to the extension of the power plant of the Department of Yards and Docks, to be divided, in part, thus: $17,000 for a 48-inch pump and a 12-inch drainage pump with piping and motors; boil-

ers, $30,000; generators, $70,000; stacks and flues, $8000; economizers, $6000, and stokers, $6000. The contract for the pumping plant has been awarded to Farrell, Hooper & Co., Washington, D. C.

The following bids were opened March 8 for supplies for the New York Navy Yard:

Bidder—4. Francis Harral, New York.
6. Vought & Williams, New York.
23. Fox Bros. & Co., New York.
25. Manhattan Supply Company, New York.
31. Fairbanks Company, New York.
36. J. Edmund Ogden Company, New York.
40. Ed. H. Taggart, Philadelphia, Pa.
43. General Electric Company, New York.
48. Thresher Electric Company, New York.
64. Keystone Electric Company, Erie, Pa.
65. Engberg's Electrical & Mechanical Works, St. Joseph, Mich.
96. H. A. Rodgers, New York.
118. Manning, Maxwell & Moore, New York.
137. Wm. Wirt Clark & Son, Baltimore, Md.
140. J. B. Kendall, Washington.
159. Drew Machinery Agency, Manchester, N. H.

Class 1. One generating set, direct coupled to vertical single cylinder, open type engine, with spare parts—Bidder 65, $545; 48, $572.20; 43, $612.65; 64, $683.

Class 25. 30 portable rivet forges—Bidder 159, $172.50; 140, $180; 36, $180.90; 4, $186; 118, $194.40; 23, $198; 31, $201; 6, $202.50 and $417; 40, $208.50; 101, $208.50; 137, $210; 96, $255; 25, $261.

Under bids opened February 9 for supplies for the Portsmouth and Boston navy yards the Northern Engineering Works, Detroit, Mich., were awarded Class 19, one electric traveling crane of 20,000 pounds capacity, $2837, and Class 20, one 20-ton, 5-ton auxiliary hoist, four-motor electric traveling crane, $3847.

Under bids opened March 1 for the Norfolk, Charleston and Port Royal navy yards, Class 2, three electric blowers and six electric fans, was awarded to the General Incandescent Arc Light Company, New York, at their bid of $384. No award was made for Class 1, three-motor electric overhead traveling crane.

The Rochester Gas Engine Company of Rochester, N. Y., announce that they have reorganized, with J. S. Graham, president; J. J. Leary, vice-president, and W. J. Graham, secretary and treasurer. J. S. and W. J. Graham have been manufacturers of machinery in Rochester for many years, under the name of the Graham Machine Company, and have recently disposed of their interests to the A. T. Hagen Company. The Rochester Gas Engine Company have increased their facilities for the building of marine, stationary and automobile engines in large quantities.

National Metal Trades Association Notes.

CINCINNATI, OHIO, March 14, 1904.—Three prominent machinery firms of Memphis, Tenn., have applied for membership in the National Association. The Walsh & Weidner Boiler Company, Chattanooga, Tenn., report that through the assistance of the association their recent labor difficulties have been overcome and all is now serene.

The convention at Philadelphia next week promises to be one of the best in the history of the National Association. A statistical report of hours and wages is being prepared, and will be embodied in the secretary's annual report. A special feature will be the reports of the several officers, which will no doubt be very instructive and interesting. It is desired that all members attending the convention will secure certificates entitling them to the reduced rate of transportation, whether they expect to use the certificate for return passage or not. The Philadelphia contingent are making elaborate preparations for their guests, and to this end have sent out invitations to a smoker to be given the first evening of the convention. The following subjects will be taken up and discussed at length during the progress of the convention: The proper relationship between local and the national associations; national agreements; annual dues; method of assessment; labor bureaus; scientific shop management.

The following statement, which appeared in the March edition of the *Monthly Journal* of the International Association of Machinists, is exciting a great deal of comment: "President O'Connell, accompanied by Messrs. Ford and Tucker of the General Executive Board, held a preliminary conference with three of the conservative members of the National Metal Trades Association in New York last month, which may lead to another agreement between the two organizations."

Following are additions to the list of officers elected for the several districts, the list now being complete with the exception of the ninth district, from which no report has as yet been received:

First District: E. P. Robinson, chairman, Atlantic Works, East Boston, Mass.; D. D. Russell, vice-chairman, James Russell Boiler Works Company, South Boston, Mass.; R. C. Payson, the Portland Company, Portland, Me.; E. E. Bartlett, East Boston, Mass.; C. H. Phillips, Boston, Mass.

Fifth District: A. Falkenau, chairman, Falkenau-Sinclair Machine Company, Philadelphia, Pa.; J. H. Schwacke, vice-chairman, William Sellers & Co., Philadelphia, Pa.; F. Macomb Cresson, George V. Cresson Company, Philadelphia, Pa.; J. J. Satterthwait, Remington Machine Company, Wilmington, Del.; Thomas Shipley, York Mfg. Company, York, Pa.

Sixth District: L. H. Colburn, chairman, Colburn Machine Tool Company, Franklin, Pa.; R. M. Downie, vice-chairman, Keystone Driller Company, Beaver Falls, Pa.; G. T. Bliss, Erie City Iron Works, Erie, Pa.; J. T. Hadley, Joseph Reid Gas Engine Company, Oil City, Pa.; E. W. Heyl, Heyl & Patterson, Pittsburgh, Pa.

Seventh District: S. P. Egan, chairman, J. A. Fay & Egan Company, Cincinnati, Ohio; P. G. March, vice-chairman, Cincinnati Shaper Company, Cincinnati, Ohio; Samuel Moyer, Lunkenheimer Company, Cincinnati, Ohio; O. P. Hopkins, United States Cast Iron Pipe & Foundry Company, Addyston, Ohio; H. M. Norris, Bickford Drill & Tool Company, Cincinnati, Ohio.

Eleventh District: M. O. Reeves, chairman, Reeves Pulley Company, Columbus, Ind.; W. J. Woolley, vice-chairman, Woolley Foundry & Machine Company, Anderson, Ind.; W. D. Hodson, National Sweeper Company, Marion, Ind.; James O. Parker, Heilman Machine Works, Evansville, Ind.; Arthur R. Baxter, Keyless Lock Company, Indianapolis, Ind.

Thirteenth District: E. C. Wells, chairman, Quincy Engine Works, Quincy, Ill.; William Medart, vice-chairman, Medart Patent Pulley Company, St. Louis, Mo.; C. A. Barnard, Barnard & Leas Mfg. Company, Moline, Ill.; L. Aulmann, Eagle Iron Works, Des Moines, Iowa; F. E. Turner, Kansas City Elevator Mfg. Company, Kansas City, Mo.

Fourteenth District: T. W. Sheriffs, chairman, Sheriffs Mfg. Company, Milwaukee, Wis.; A. Aldrich, vice-chairman, Beloit Iron Works, Beloit, Wis.; G. W. Hanley, A. W. Stevens Company, Marinette, Wis.; A. J. Lindemann, A. J. Lindemann & Hoverson Company, Milwaukee, Wis.; S. L. G. Knox, the Bucyrus Company, South Milwaukee, Wis.

Sixteenth District: E. Burkitt, chairman, Southern Engine & Boiler Works, Jackson, Tenn.; T. J. Caldwell, vice-chairman, Caldwell Watson Foundry & Machine Company, Birmingham, Ala.; W. N. Taylor, Memphis Machine Works, Memphis, Tenn.; Thomas L. La Malta, J. C. Duke Machine Works, Memphis, Tenn.; M. Llewellyn, Walsh & Weidner Boiler Company, Chattanooga, Tenn.

Seventeenth District: G. W. Watts, chairman, Canadian General Electric Company, Ltd., Montreal, Canada; J. O. Thorn, vice-chairman, Metallic Roofing Company of Canada, Toronto, Canada; F. B. Polson, Polson Iron Works, Toronto, Canada; C. Bermingham, Canadian Locomotive Company, Kingston, Canada; Wm. Hamilton, Wm. Hamilton Mfg. Company, Peterborough, Canada.

The first of the four large new blast furnaces of the Lackawanna Steel Company at Buffalo, N. Y., known as No. 3, will probably be blown in on April 15. The coal mines of the company at Wehrum, Pa., will be started early in April, while the by-product coke oven plant at Buffalo will be in operation during the latter part of April. By the early part of June the entire plant—the structural mills, plate mills and open hearth furnaces—will be in operation, with the exception of the bar mill.

Robert G. Holbrook, formerly a well-known shipbuilder, and for the past 25 years proprietor of the Vulcan Iron Works, Oswego, N. Y., died March 11, aged 75 years.

Andrew Carnegie's Gift to Engineers.

A little over a year since Andrew Carnegie offered to the four national engineering societies, the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers, and to the Engineers' Club, the sum of $1,000,000, more or less, for the erection of two adequate buildings, the one to be the home of the technical societies named, and the other to be the house of the social organization known as the Engineers' Club. Subsequently he increased the sum to $1,500,000. In the meantime the representatives of the engineering societies had purchased five lots on West Thirty-ninth street, between Fifth and Sixth avenues, New York, for a sum aggregating about $517,000, the money for the purpose being advanced by Mr. Carnegie. Prior to this time the Engineers' Club had acquired title to two lots on West Fortieth street, facing Bryant Park and the new public library, the location being also between Fifth and Sixth avenues, and communicating directly with the lots for the Engineering building on West Thirty-ninth street.

Three of the engineering societies as promptly accepted Mr. Carnegie's gift as it was possible to secure a binding expression of opinion from their members. The American Society of Civil Engineers voted on the proposition adversely, the result being announced in the early days of the current month.

The impression had become quite general that possibly the withdrawal of the American Society of Civil Engineers might lead to the abandonment of the entire project. During the past week, however, Mr. Carnegie has decided, after a study of the resources of the three national societies and of the Engineers' Club, to proceed along the lines laid out before the latest occurrences. He has now addressed to the three societies, the Mechanical Engineers, the Mining Engineers, and the Electrical Engineers, and to the Engineers' Club, the following letter, under date of March 14:

"It will give me great pleasure to devote, say, one and a half millions of dollars for the erection of a suitable Union Home for you all in New York City. With best wishes, truly yours, Andrew Carnegie."

It is understood that a number of other kindred engineering organizations will be offered a home in the new building, among those who have made application being the American Society of Naval Architects and Marine Engineers, the New York Electrical Society, the American Gas Light Association, and the New York Railroad Club.

Matters have progressed in the meantime very far in the direction of preparing for plans and specifications for the two new buildings. The Engineering building will probably be twelve stories in height, with a frontage of 125 feet, and will contain one large auditorium capable of seating from 1200 to 1500 people, a number of smaller meeting halls, the executive offices of the different engineering societies, and one noble library which will be ample to house the libraries of the present societies as well as the accessions which are likely to come to them in the course of time. It is hoped that this building will be ready for occupancy in 1906.

The Engineers' Club will probably be able to begin the work of erection on the two lots on Fortieth street in July of the current year. The building will have ample accommodations, not alone for the usual facilities of a modern club, but will also have ample quarters for the housing of visiting members, the non-resident membership of the club being a very large one.

The representatives of the four bodies interested in Mr. Carnegie's gift are: Prof. F. R. Hutton, C. Wallace Hunt, and J. M. Dodge of the American Society of Mechanical Engineers; Dr. A. R. Ledoux, Theodore Dwight, and C. Kirchhoff of the American Institute of Mining Engineers; C. F. Scott, Dr. S. S. Wheeler and Bion J. Arnold of the American Institute of Electrical Engineers, and J. C. Kafer, W. H. Fletcher, and T. C. Martin of the Engineers' Club.

Announcement is made that negotiations carried on during the past month for the sale of the plant of the G. C. Kuhlman Company, Collinwood, Ohio, manufacturers of electric railway cars, to the J. G. Brill Company of Philadelphia have been closed, and that the plant will be turned over to the purchasers at once. The Kuhlman Company have been in business for a number of years at Cleveland, and two years ago erected a plant having a capacity of 500 cars per year at Collinwood. They have since closed contracts and supplied cars to many of the leading interurban and city roads of the country, and were among the strongest competitors of the J. G. Brill Company, who have large plants at Philadelphia and St. Louis. It is very probable that the Collinwood plant will be continued in operation.

The Wellman-Seaver-Morgan Company's New Offices.

The Wellman-Seaver-Morgan Company, Cleveland, Ohio, are now occupying an office building erected for their own use adjoining their new plant at the corner of Giddings avenue and the Pennsylvania Railway tracks. The building is 60 x 140 feet, steel frame work, hard pressed brick exterior and armored concrete slabs on the interior. At present the building is four stories high, but it is designed to carry seven stories, and the other floors will be added when required. The floors in the hallways are marble, and the wood work is all antique oak.

The first floor is devoted to the general offices, the auditor's office, purchasing agent, assistant works manager, paymaster and stenographers, also a telephone exchange connecting all offices and all departments of the plant with the city system. On the second floor is the drafting department, which is one large room, 40 x 120 feet, with tables and appliances for 150 men. This room, as well as all other offices, is illuminated with Nearnst lamps, a one glower lamp being placed over each drafting table. Adjoining this room is a drawing vault, 15 x 40 feet. Offices are also provided for the superintendent and the order department. A dumb waiter connects the drafting room with the blue print room below. The third floor contains ten private offices for the engineering department and the estimating department, and six private offices, a general office and a large drafting room occupied by the Electric Controller & Supply Company, affiliated with the Wellman-Seaver-Morgan Company. The fourth floor is fitted up with private offices for the directors, president, first, second and third vice-presidents, general manager, secretary-treasurer, assistant treasurer and stenographers.

In addition to two toilet rooms on each floor there is on the fourth floor a bathroom with elaborate equipment, together with a barber shop for the use of officials and heads of departments. In the basement is a large dining room for office employees, where luncheon is served on a basis of $5 per month. There is also a private dining room for officials and heads of departments. Between the two dining rooms is a large and well equipped pantry and kitchen. The blue print room in the basement contains two Pittsburgh Blue Print Company's electrical blue print outfits. The building is steam heated by an Erie City boiler, using natural gas as fuel. One of the special features of the building is the ventilating system. There are two flues in each pilaster running from basement to roof, with two openings in each room, one being above and one below. In the summer the lower ventilator is closed and in the winter the upper. Fresh air is brought into each room between the coils of the steam radiators, so that it is thoroughly warmed in winter. Circulation is effected by two motor driven Sturtevant fans on the fifth floor, in a small room for this purpose. It is claimed that the entire atmosphere in the building can be changed in 20 minutes and that the temperature may be maintained at practically any point, summer or winter. During the erection of the building all plaster and concrete in the building were thoroughly dried out in less than one week by aid of the ventilating system.

At the annual meeting of the stockholders of the Sloss-Sheffield Steel & Iron Company, held in Jersey City, March 15, F. P. Olcott, president of the Central Trust Company, was elected a director. Mr. Olcott succeeds A. E. Ames, of Toronto, who declined re-election.

HARDWARE.

THE statistics which show the export of Hardware and related lines to foreign markets are, on the whole, decidedly encouraging. They indicate an increased volume and a larger variety of goods. This comes, in good part, from the result of efforts made during years past to secure a foothold in such markets, establishing trade, frequently on a small scale, which has naturally developed to large proportions. It is connected, too, with recent vigorous and enterprising measures on the part of our manufacturers to establish relations abroad, and find an outlet not merely for their surplus goods but for a regular, and if may be a considerable, proportion of their product. There is, however, no doubt that with some manufacturers the pressing home demand during recent years has made them negligent of their opportunities abroad and of the duty of making foreign connections when the opening presents itself. A large measure of success attended the invasion of American goods into foreign markets, and in many a field the door seemed to be ready to open to enterprising manufacturers. It is, however, now being learned that the work of introducing new lines is not in all respects so easy, and that in certain lines the markets of the old world are not quite so accessible to our products. While manufacturers here have been giving their attention to domestic trade, their competitors abroad have not been idle. There have been in many cases an approach to American methods of manufacture, the use in not a few instances of our machinery and appliances, and, what is more annoying and troublesome, the imitation, if not the counterfeiting, of our goods. Those on the other side of the sea are naturally on the alert, and are determined to hold their own against American aggression. They are undoubtedly recognizing more fully than ever before the danger which threatens them from American competition. Some of our anticipations of an immediate and decisive success in certain markets, at least, will need revising. There are thus difficulties enough in the way of American export trade to stir the energies of those who deserve to succeed in finding a foreign market and to prepare the way for a large and permanent business, which is still fortunately within the reach of our manufacturers. When the same measure and quality of attention is given to building up foreign trade as is employed in the cultivation of domestic business it will be an entirely different story.

Merchants in many a town and city will sympathize with the effort which is now being made under the leadership of the Merchants' Association of New York to abolish by legislative enactment the harmful effect of the use which is made of trading stamps. This system, which has so disturbing an influence on business and has resulted not only in injury to the trade but loss to the public, can, it is thought, be practically abolished by equitable and constitutional means. Under the terms of the bill proposed the redemption of trading stamps in merchandise or cash is obligatory, at the option of the holder, at the face value of the stamps, and in any quantity. By such a provision it is obvious that the trading stamp business as at present conducted would be throttled and the community freed from its demoralizing influence. Meanwhile, in many communities, merchants who recognize the evils of the system have succeeded in preventing it from securing a foothold in their communities, and even in stamping it out where it has been put in operation. In this matter it is obviously the part of wisdom that merchants would rely upon their own efforts and not wait for statutory prohibition of the practice.

Condition of Trade.

There is general agreement that trade in the East is better than a week ago, while reports from the rest of the country are in most cases quite satisfactory, and indicate the regular movement of a good volume of business. This condition of things is partly a natural result of the advance of the season, when, with the coming of spring according to the calendar, if not in all cases with the mildness and warmth of springtime, there is a natural quickening in the demand. A portion of the business, too, comes from jobbing houses who had purchased conservatively, and have already found it necessary to replenish their stocks, and from retail merchants who, influenced by similar caution, bought moderately or deferred their principal purchasing until the situation became to them more clearly defined. There is also in the market something of a better feeling, inasmuch as the indications point to a fair movement of goods during the present season, so that the feeling is quite generally expressed that there is little reason to apprehend any change in the main features of the market during the next two or three months. After that the crops will have a dominant influence in the situation. There is still much trouble experienced in connection with transportation, and the railroads, partly as the result of the severe winter, are seriously congested at many points, and annoying delays in deliveries are constantly occurring. There is little change in the tone of the market so far as values are concerned. Prices, on the whole, are fairly steady with only minor changes. The general tone is not especially strong, but there is not enough of softening to justify a neglect to purchase goods in sufficient quantities for the regular requirements of trade.

Chicago.

(*By Telegraph*).

Last week's sunshine, the Northern flight of wild geese, the toning up of the general Iron and Steel markets and the advances in some lines all conspire to quicken the pace of the Hardware trade. Farmers, in the aggregate the largest consumers of the Hardwareman's goods, are prosperous, with mortgages lifted, with money in the bank and with bonds and stock certificates tucked away in the bureau drawer. The recent advance of $1 per ton on Wire Nails and Barbed and Smooth Wire has not only quickened these lines, but has led to a buying movement on the part of Hardware dealers in other Wire products which have not yet been advanced. This is particularly true of Fencing and Poultry Netting. The Hardwareman's show window is beginning to take on a spring aspect, and urgent orders are being received by jobbers and manufacturers for immediate shipment of spring goods ordered some time ago. This urgency will be given a temporary quietus by the widespread snowfall of Sunday and Monday, and will give jobbers a chance to catch up with belated orders. If the snow should be followed by a week of warm weather the utmost efforts of jobbers and manufacturers would be required to effect shipment of the large orders still in hand. Spring and summer goods are moving rapidly, and already orders are being booked in considerable quantity for fall and winter lines.

San Francisco.

PACIFIC HARDWARE & STEEL COMPANY.—The California State Retail Hardware Association held their annual convention in this city last week. This brought together the largest attendance that they have ever had, and the interest shown indicates the appreciation of the members of the work done in the past and speaks well for the future of the association. It is to be hoped that they can still further increase their membership, and thus increase the field of operations.

The past month has not been particularly favorable for business, principally on account of the weather conditions. In some parts of our State we have had extremely wet weather, while in others it has been exceedingly dry. In the sections that have been plentifully visited by rain we look forward to a most prosperous season, and the prospects for the spring trade, which should soon commence, have never been better. On the whole we are much pleased with the outlook for the future, and believe that we shall be able to send you encouraging reports from time to time.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Local trade is feeling the adverse effects of the unprecedented floods in all the river valleys in the eastern slope of the Alleghenies. Added to the damage resulting from the highest stage of waters ever known in most localities is the problem of getting rid of the immense amount of ice left by the receding water, in some localities covering parts of towns and cities, railroad tracks, farms, &c., to a depth of as much as 18 feet, closely packed and frozen into a solid mass. As this will have to melt before property can be repaired, it will greatly add to the distress of those who would otherwise be able to at once return to their flooded homes and stores.

The lingering winter has added to the reputation of the groundhog, and fully confirmed his shadowy augury in the minds of goose-bone weather prophets. Conditions seem best described by betwixt and between. Orders from those who always specify well in advance of their wants have been filled, and those who wait for the buds and bluebirds are still waiting for the spring demand before buying. Something will happen before long, no doubt, both here and in the Orient, though just at present there is a dearth of news.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Trade from the South and West continues good. The recent pleasant weather shows its effect in increased size and number of orders from the Northern States. Locally, great activity prevails as a result of the preparations for the coming Louisiana Purchase Exposition. The residents of this city are preparing to entertain their country cousins. Therefore house cleaning, painting, decorating, &c., are being carried on upon an unusually large scale. Labor is scarce, quality is poor, and rumors of labor troubles are in the air. St. Louis is noted as a city of travelers, but this summer we will all stay at home and extend the "glad hand" to our visitors.

Many of us did not want the World's Fair, but when we stand on Art Hill with the panorama of stately and magnificent buildings spread out before us, we are compelled to admit that the citizens of St. Louis will have no cause to be ashamed of their "show" as compared with the expositions of Paris and Chicago.

The large number of inquiries now being received from dealers all over the country has made it necessary for all of the prominent wholesale houses to establish bureaus of information in regard to hotel accommodations, boarding houses and rooms for their friends and customers. Therefore, manufacturers, retail dealers and others who intend to visit St. Louis the coming summer should not hesitate to write their jobbing friends on this subject, as all wholesalers here in every line are prepared to extend all necessary assistance in this direction. In writing we suggest you give full details in regard to your party—such as number, relationship, and those who are willing to occupy the same room; the kind and cost of accommodations you want, whether down town, in the suburbs of the city, or in the immediate vicinity of the Exposition Grounds. All accommodation reserved must be paid for in advance and certain fixed dates agreed upon. We suggest, if your party is composed of elderly persons, ladies or children, you make your arrangements to stop within walking distance of the Grounds.

There will be ample accommodations for people of modest means. If there is any scarcity of accommodations it will be only of a high class nature in expensive hotels. Therefore, those who desire the luxuries of the very best hotels during their visit to the World's Fair should secure their quarters without delay.

The Exposition will open April 30. We would advise our friends, however, not to come before the month of June, as by that time the grounds and the exhibits will have received their finishing touches. Many merchants cannot afford to be away from home during the fall trade. Therefore we expect a large number of visitors of this class during the months of June and July.

To those who have no personal acquaintances in this city who could identify them, we suggest before leaving home they have their firms or their local banks write a letter to some business correspondent in St. Louis in regard to their credit, with the personal signature of the visitor attached, so they will have no difficulty in identifying themselves and having their drafts cashed should they run short of funds while here. During all great World's Fairs there are imposters. Wholesale houses at such times are compelled to be unusually careful in cashing drafts. Therefore, it is only fair and prudent that a merchant visiting this city without any personal acquaintance should make such arrangements that he will have no trouble in identifying himself.

It would also be a good idea to have all your mail, telegrams, &c., sent to this city in care of a certain correspondent, and to carry in your pocket written instructions in case of accident to immediately communicate with that house. Among the millions of people who will visit St. Louis this summer there will be cases of sudden sickness and some serious accidents, and we offer these suggestions believing them worthy of consideration.

Cleveland.

THE W. BINGHAM COMPANY.—The advanced prices recently made on Shelf Hardware, such as Locks, Latches, Knobs and other house trimmings, also miscellaneous Hardware, which the manufacturers felt obliged to make on account of the readjustment in price of material and labor, also in view of the low prices at which these goods have been sold in the past, is stimulating very largely the trade on these goods, and as the jobbers here and in some other districts are well supplied, they are taking good care of their customers.

The large purchases of Pig Iron recently reported by the United States Steel Corporation from the outside furnaces have had their effect in bolstering up the jobber, retailer and the consumer with the idea that there is a good big trade due us, and coming to us, in spite of the continual pessimism indulged in by some chronic complainers. The resources of our great country and the demand for all kinds of commodities, and the good prices that the farmer is getting for his products and the laborer is getting for his work, go a great way to encourage people to see and feel that prosperity is going to remain with us. The great loss by fire in Baltimore and Rochester, destroying property of all kinds—in fact, entirely destroying buildings and stocks of goods—and the alertness with which the owners of the property commenced at once, as it were Phœnix-like, to rise from the ashes, to rebuild their stores and warehouses and accumulate stocks and take care of their trade, encourages everyone to feel that there is no real cause for alarm or indulging in the pessimistic idea, as some like to do, that trade and barter are going hard and slow. We don't believe it! In fact, indications from almost all sources point in the other direction, and our advice to the retail trade is to buy immediate wants promptly and anticipate future wants and get the goods in stock. There is a lot of money in the country, and people will indulge in luxuries and necessities, for they are still cheap and people are used to having what they want, and it will be hard to change this condition.

The recent advance in Wire and Nails of $1 a ton is also helping to stimulate trade. There are only a few large orders placed early by the retailer for spring shipment in anticipation of large profits to be made thereon. They buy what they want and pay for it promptly, which is the only legitimate way to do.

On the whole, trade in this section, and also the trade that the Cleveland jobbers serve, seems to be in a good, healthy condition. We say to our friends in the trade,

that have not already bought, to get their orders in for Lawn Mowers, Refrigerators, Freezers, Lawn Hose, Screen Doors and Windows and Steel Goods, such as Hoes, Forks, Rakes and Shovels. There is not an overstock of Steel Goods at any place in the country, as Handles are very scarce. Buy what you want at once, and take it into stock if you can get it and be ready for the spring trade, which will undoubtedly open up very soon, for after the long and strenuous winter that we have had indications are that we will have an early spring. Do not be afraid to buy your legitimate wants of those who can serve you promptly, but do not speculate. Keep your stock well assorted. The fellow that has the goods in stock nowadays gets the business.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The market continues very steady under what seems to be normal demand. Business in the north country has been somewhat retarded by reason of the extreme cold and long continued prevalence of snow and ice. In the local and south country, on the contrary, the winter has been dry and pleasant, so that the country roads were available for ordinary teaming all winter long. We fancy that most order books hereabouts show an increase over the previous year—at least that is the record made in the various branches of trade as far as we can gather.

The advance in Wire and Nails came as a general surprise to the trade. Talk on these goods had been down grade for so long that we thought the factories were doing well to hold the market at an even figure. It has proven somewhat stimulating, but the lack of speculative demand anywhere prevents the purchase of any large lots for the purpose of holding. In other words, consumers have a firm conviction that there will be no trouble in getting supplies as they need them at present prices or near to them. Nobody is on the anxious bench.

The rivers are at last all opened, and some of the tributaries of the Ohio which have been closed to navigation for almost a year by low water and then by ice are enlivened by the passage of steamboats with their assorted lots of freight.

Building operations in our own city have been somewhat retarded by the strike of the constructive iron workers. The advance in wages demanded was so considerable that it has not been met. Meanwhile a couple of months which would have been favorable for building have been wasted.

The absurd ends to which professional labor agitators go are shown in the bills pending in Congress, which vitally concern the social and commercial interests of the whole country, every manufacturer and every laborer alike. First, the Eight-Hour bill, making it illegal for any contractor to employ labor more than eight hours a day, no matter if the laborer is perfectly willing to work and could obtain a proportionately better rate of compensation therefor. The great achievements of the world have never been done under the eight-hour provision or by those who are dead set on forcing it on other people, whether desired or not by the main parties in interest. The leveling process is certainly a degrading one for human ambition and ought never to be rendered obligatory. The other one is the Anti-Injunction bill. While the injunction has been sometimes abused, there are times when it is the only safeguard against violence and destruction; to pass it would be nullifying the courts. It is fair to presume that the good sense of Congress will prevent any serious mistake in either of these bills.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The Hardware jobbers of this city, while not having the excessive rush that was experienced during January and February, are still very busy, and the sales for March will make a very satisfactory showing, probably an increase over last March. All spring and summer goods are moving in liberal quantities, and there is a scarcity of Poultry Netting, Wire Cloth, Garden and Farm Tools. The trade in Fishing Tackle this spring has been the largest ever known. Prices in most all lines are firm and being well maintained. The credit men of the different local houses advise us that collections are coming in in first-class manner and are better than usual.

Boston.

BIGELOW & DOWSE COMPANY.—The only indication of spring thus far is that the sun rises a bit earlier and sets later, but his rays are not direct enough yet to produce any great change in the temperature. Notwithstanding that some of the ice and snow has been melted by warm rains, there is volume enough left in the surrounding country to make the air cold and chilly and postpone the advent of spring.

This winter beats any late record, with 66 inches of snow and over 90 days of good sleighing in and about Boston. Winter goods should have a good sale next year, as everything in the way of Ice Chisels, Snow Shovels and other kindred items have been sold.

The firmer prices in general Hardware and the advance in Wire and Nails are being well maintained. Spring shipments on early orders are going forward rapidly. Many are hurrying orders which are being delayed by shortage of cars and blocks on the railroads. It is feared these delays will increase as the season advances. Orders for general Hardware show a pleasing increase. Prices are firm and well maintained.

The outlook indicates a rush of orders as the season advances. The systematic advertising of the Bicycle this season is sure to create a larger demand. The machines are made better this season, and sample orders are being placed freely. What we want is some warm spring weather.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—From bad to worse is the best that can be said for February's business. For the little that was offered there was such a scramble that demoralized prices were worse demoralized. There are too many in the field, and if some are not drawn off somebody will get hurt. In the grand round up it would seem as though the jobbers longest in the field would have the best of it.

If it were not for politics, that are now simmering, as our election comes early in June, things would be dull. After State comes national, and if we can have McClellan and Taggert *vs.* Roosevelt and Fairbanks, the heads from New York and the tails from Indiana, we ought to have excitement and interest enough so that we could do without business the last six months of 1904.

The weather in this section shows some improvement in March, and it is devoutly to be hoped that the improvement will continue. Trade is far from what it should be, and collections are worse than trade.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—Considering the very changeable character of climatic conditions usually occurring just at this season of the year, and which is not an exception at the present time, the general volume of business may be stated as very satisfactory indeed.

Reports received from the territory tributary to this market coincide with the views expressed by visiting merchants. All report conditions as very favorable for a large spring business, and all feel confident that as soon as the weather will permit outdoor work a general rush in business affairs will promptly develop. The common opinion prevails that the conditions existing at the present time are of the most healthy kind, and dealers, as a rule, exhibit no fear of carrying a liberal supply of goods on hand, feeling assured of the coming demand, and with a reasonable confidence that the present schedule of values will not be disturbed to any notable extent.

NOTES ON PRICES.

Wire Nails.—The advance in price has had the effect of stimulating rather than diminishing the demand. Trouble is being experienced in getting prompt shipments, both on account of shortage of cars and the congested condition of the railroads. The market is very firm at the following quotations: Jobbers, $1.90, base, for carload lots; retailers, $1.95, in carload lots, and $2.05 for less than carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days.

New York.—There is a noticeable improvement in demand for small lots from store, and an increase in requirements from nearby territory is in evidence. Jobbers are generally asking 5 cents more than before the recent advance, as follows: Single carloads, $2.10; small lots from store, $2.20.

Chicago, by Telegraph.—There is no let up in demand, and, as has been repeatedly stated, the recent advance in price has served to stimulate buying, rather than the reverse. Quotations are as follows: Carload lots to jobbers, $2.10 per 100 pounds; less than carloads to jobbers, $2.15 per 100 pounds; carloads to retailers, $2.15 per 100 pounds; less than carloads to retailers, $2.25 per 100 pounds, all f.o.b. Chicago.

Pittsburgh.—Demand for Wire Nails continues extraordinarily heavy, and the mills are pushed to their utmost to get out Nails as fast as wanted. The mills are having trouble in getting Steel promptly, and the supply of cars is very short, which interferes very much with shipments, with the result that some of the mills are considerably behind in orders. The recent advance of 5 cents per keg is being firmly maintained. We quote Wire Nails at $1.90 in carloads to jobbers, $1.95 in carloads to retailers and $2 to $2.05 in small lots to retailers, all f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days, plus actual rate of freight to point of delivery.

Cut Nails.—The increase in the price of Wire Nails has led to an expectation on the part of some of the trade that an advance may be made in Cut Nails by the manufacturers at their meeting next week. A reported increase in demand from some sections of the country is attributed to this cause. The market is steady at the following quotations for Steel and Iron Nails, in all quarters: $1.70, base, in carloads, and $1.75 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—A slight improvement in demand is noticed, which will probably grow more pronounced as the weather becomes more settled. Quotations are maintained as follows: Carloads on dock, $1.84½; less than carloads on dock, $1.92½; small lots from store, $2.

Chicago, by Telegraph.—No change in price is expected until the meeting of association the last week in this month, at which time an advance is not improbable. The realization of the possibility of an advance is leading large users of Cut Nails to anticipate their needs and order in stocks of some magnitude. Quotations are as follows: Both Steel and Cut Nails, to jobbers, carload lots, $1.86½, base, Chicago; less than car lots, $1.91½, base, with the understanding that consumers and retailers are to be charged 10 cents advance over these prices. Jobbers are charging $2.10, base, from store in small lots.

Pittsburgh.—Demand for Cut Nails is fairly good and the leading mills have about all the business they can handle. We quote Steel and Iron Cut Nails at $1.70, base, in carloads, and $1.75 in less than carloads, f.o.b. mill, terms 60 days, less 2 per cent. off in 10 days.

Barb Wire.—A continuance of the heavy demand is a prominent feature of the market, and mills are experiencing difficulty in keeping pace with the demand. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago, by Telegraph.—The remarkable development of Southwestern States and the uninterrupted succession of good crops in newly opened territory is being reflected in large orders for fencing from Oklahoma, Indian Territory, Kansas, Texas and Arkansas. This applies not only to Wire Fencing, but to the more expensive Woven Fencing. The recent advance of $1 per ton in Wire Fence has not interfered in the least with the active demand for this product. Quotations are as follows: Carload lots, Painted Wire, $2.40; Galvanized, $2.70; to retailers, carload lots, Painted, $2.45; Galvanized, $2.75; to retailers, less than carload lots, Painted, $2.55; Galvanized, $2.85; Staples to jobbers, $2.25 for Plain and $2.65 for Galvanized, with 5 cents advance to retailers.

Pittsburgh.—Demand continues very heavy, and the mills are shipping out their product on orders as fast as they can get cars. The tone of the market is very firm. The usual slight differential is allowed for the large jobbing trade over prices quoted below. We quote as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days: Plain Wire, $1.85 base, for Nos. 6 to 9, in carloads to jobbers, and $1.95 to $2 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14.

Smooth Fence Wire.—The demand continues heavy, and mills are behind in filling orders. Quotations are as follows, f.o.b. Pittsburgh; terms, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.80
Retailers, carloads	1.85
Less than carloads	1.95

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—Wire is finding wider and wider fields of usefulness, and clever men are daily discovering methods in which Wire can be substituted for wood or for other materials. This, added to the constantly increasing demand for Wire for fencing purposes, explains the fact that Wire mills are all running full time with full force of hands, many of them double turn, and that in spite of magnitude of their output they are as a rule from 30 to 60 days behind their orders. Quotations are as follows: Smooth Fence Wire, sizes 6 to 9, $2 per 100 pounds, in carload lots, to jobbers, f.o.b. Chicago; $2.05 per 100 pounds to retailers in carload lots, and $2.10 in less than car lots.

Common Carriage Bolts, Machine Bolts, Etc.—The manufacturers of Common Carriage Bolts, Machine Bolts, Coach and Lag Screws, &c., had a meeting in New York to-day (Wednesday) and made a general revision of their quotations, advancing prices as indicated below. The reports in regard to business were exceedingly satisfactory, practically all the manufacturers having booked many orders and prices being very well maintained. In view of the condition of the market, the following advanced prices are announced:

Common Carriage, ⅜ x 6 inches and smaller and shorter	75 %
Common Carriage Bolts, longer and larger than ⅜ x 6 inches	70 and 10 %
Machine Bolts, ⅜ x 4 inches and smaller and shorter	75 and 10 %
Machine Bolts, longer and larger than ⅜ x 4 inches	75 and 5 %
Machine Bolts with C. & T. Nuts	70 and 10 %
Machine Bolts, without Nuts	75, 5 and 10 %
Bolt Ends	75 and 5 %
G. P. Coach Screws	80 %
Cone Point Lag	80 and 5 %
Skein Screws	80 %

The prices given above for Common Carriage Bolts are for the regular cut thread, but on the rolled thread prices are a little lower, ⅜ x 6 inches and smaller and shorter being quoted at discount 75 and 5.

Cordage.—Spring demand is becoming more pronounced, as shown by an increase in the number of orders received by manufacturers. The busy time is about commencing, and usually continues through April and May. Quotations on the basis of 7-16-inch diameter and larger, are as follows: Pure Manila, 12 cents per pound, with a rebate of ¼ to ½ cent per pound to largest buyers; other grades of Manila, 10 to 11 cents, according to quality; pure Sisal, 9¼ cents, with ¼ cent rebate to largest buyers; Mixed Sisal, 8 cents per pound, with no rebate.

Binder Twine.—While the time is certainly drawing nearer when the price of Binder Twine will be announced by the International Harvester Company, no intimation of the exact date when it will be done has been given, except the reported utterance of representatives of the company to the effect that the price would not be announced earlier than last year, and that the probabilities were that it would be later. The announcement was made last year on March 30. Various opinions have been expressed regarding probable prices by men of the Twine trade, ranging from last year's price to ¼ to ½ cent less, on carloads. It is understood that some Western Twine has been offered at ½ cent less than last year's price.

New York State Association of Retail Hardware Dealers

CONCLUDING REPORT.

PRESIDENT HALLOWELL opened the Wednesday afternoon sesssion by reading the following telegram from John G. Ferres, the first vice-president of the association, who was detained at his home in Johnstown by sickness, and to whom a telegram was sent earlier in the meeting:

Express to the association my high appreciation of their words of sympathy and encouragement. They are

like rays of sunshine in my sick room. I am keenly disappointed in not being with you. I believe the present convention will be the greatest in our history.

Evolution of the Wire Fence.

G. G. Stuart of the Pittsburgh Steel Company made the following address on "The Evolution of the Wire Fence":

Back in the early 70's about the only manner we had of fencing our farms was the old rail and stump fences. In the year 1873 Joseph Glidden invented the Barb Wire which has become universally used. It immediately relieved the situation of the New York State farmers, who have since used thousands of tons of it, being distributed to them by the various Hardware dealers. Shortly after the invention of Barb Wire it became evident that there was a demand for a better class of Fencing, and you will remember a few years ago there appeared upon the market various makes of what was known as Braided Wires. This class of Wire had a large sale for a short time, but it became evident that it would not satisfy the demand of the farmer. Then came the various fences that were built from Plain Wire upon the farm. This class of fence also had a large sale for a short time. After the passing of the hand made fences on the farm came the present field fence, which we think will fill all requirements of the farmer. The secret of a good farm fence is the stay, which holds the lateral wires together.

A LARGE FENCE BUSINESS.

The State of New York in round numbers contains about 48,000 square miles. To fence the State of New York into 40-acre tracts it would require 12,236,000 rods or 382,000 miles of fence. Estimating on an average carload of fence, it would take 3500 cars to fence New York into 40-acre tracts. Again estimate the value of one carload of fence at $800, it would require $2,800,000 worth of fence to fence New York into 40-acre tracts—that is, that is what it would cost the merchants of New York to supply it, based on the present prices of Fencing.

Three classes of dealers handle Fencing—Hardware dealers, Implement dealers and Lumber dealers. The proportion that each class of dealer handles in the State is about as follows: Hardware dealers, three-quarters, the balance being divided equally between the Implement and Lumber dealers. This, of course, is largely estimated, but in the main is correct. This would give the Hardware dealer about $2,100,000 worth of fence to distribute to the farmers of the State of New York.

COMPETITION.

Fighting competition is one of the worst features of selling fence by the retail merchants. The average manufacturer is turning out about 30 different styles of Fencing, and, as you are aware, Fencing is made in both 6 and 12 inch stays. Take, for example, a 26-inch, 6-inch stay fence that costs you 22 cents per rod. Your competitor is handling a 26-inch fence with stays 12 inches apart, the latter fence costing 4 to 5 cents less. You can see how easy it is for the farmer to be misled. When you name him a price on a 6-inch stay fence your competitor is quoting the same hight fence in 12-inch stay. Most of you handle too many different kinds of fences. You will find it much more profitable to take some four or five of the leading selling sizes of one single manufacturer and push them.

FENCING IS USUALLY SOLD ON THE AGENCY PLAN,

so you are not likely to have the same fence to compete with in your own town, but the farmer will often claim he can buy the same article in another town much cheaper. I would suggest that in each locality the various Hard-

JOHN G. FERRES, President.

ware merchants who handle the different styles of fencing get together and form a fence association, establish prices and maintain them. One very good plan is to make one price for cash, advancing that price, say, 2 cents per rod to farmers who will not pay cash, and in time you will find that this will have the effect of selling 75 per cent. of your Fencing for cash. This plan of selling Fencing is now being worked successfully by a number of Hardware dealers in New York State.

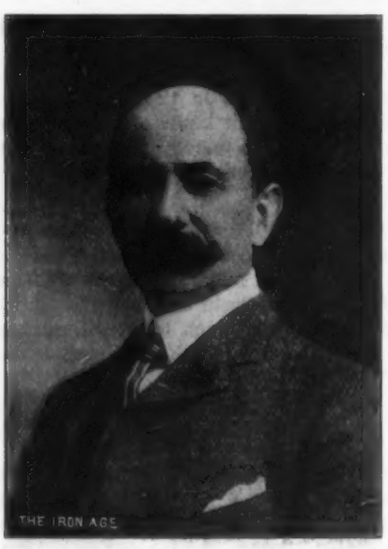
An agency for a good field fence is one of the most valuable agencies that goes into a Hardware house at the present time, and no up-to-date Hardware dealer can afford to be without some good fence agency. Do not use Fencing as a leader to draw trade from a long distance. Your investment in a carload of fence is too great to be used for this purpose. Probably the average Hardware stock in a small town will not run over $3000 to $5000, and investment in a carload of fence alone will be one-fifth of the value of the entire stock, and one cannot afford to use this amount of his capital without making a profit on it.

A Wideawake Farmer.

President Hallowell followed by relating an incident that happened in Penn Yan during the coal strike when wood was being bought for fuel. A progressive farmer sold all his Fence Rails for this purpose and realized $262 for them. He replaced them with Wire Fencing, for which he paid $150, and so was $112 ahead in the transaction.

Theory and Practice in Business.

This subject was discussed by R. R. Williams, Hardware editor of *The Iron Age*, who spoke principally in regard to Hardware association work and its usefulness in view of the extent to which theories commonly held in regard to the place of the manufacturers, jobbers and retailers are interfered with in practical business. Suggestions were made also in regard to means by which association work can be most successfully prosecuted. Mr. Williams also touched upon the need on the part of Hardware merchants generally of keeping in touch with the



C. P. SHERWOOD, First Vice-President.

progress which is being made in business matters and in pushing actively for the securing of trade.

Honorary Membership for Travelers.

Secretary Taylor then proposed that an honorary membership be created for the admission of commercial men of the State into the association, and said that he thought the association would be greatly helped by having them in the organization.

Mr. Corey pointed out that the objects of the association as tabulated said nothing that interfered with the proposition, and expressed himself as in favor of it. Commercial men in Indiana have been admitted as honorary members of that organization, and since their admission the jobbers have worked more in accord for the association's success than ever before, and have in many cases instructed their travelers to talk up the association to dealers, and try to get them to join it, believing that in doing so they will become better and more successful customers. In Indiana they gladly pay $1 a year as dues, and this money is used to defray the expenses of a smoker given in connection with their annual convention, to which every manufacturer and jobber present is invited.

The president, on motion, appointed the following committee to consider the matter and report on Thursday: C. P. Sherwood, W. E. Cook and J. B. Foley.

Commercial Men Hold a Meeting.

The following commercial men held a meeting in the library: P. R. Woodcock, W. H. Barker, G. M. Pickstock, H. R. Chambers, G. G. Stuart, C. A. Parkhurst, A. E. Coe, S. McClelland, J. P. McKaigh, L. A. Wegman, Scott C. Ball, H. A. Fisher, Jr., and Geo. R. Benjamin. They adopted the following resolution, which was presented to the association by Herbert M. Williams of *The Iron Age:*

Resolved, That our hearty thanks be extended to the New York State Association of Retail Hardware Dealers for their courtesy in permitting our attendance at so large a part of their convention sessions.

On Secretary Taylor's motion this was received, and placed on file, and a letter of thanks was directed to be sent to each of the subscribers to the resolution.

Mutual Insurance.

Mr. Corey followed with a talk on insurance, in which he pointed out that the National, the Minnesota and the Pennsylvania companies will take insurance to the extent of $3000 each from association members, a total of $9000 of what he considered perfectly safe insurance. He explained in answer to a question that on losses these companies accepted the adjustment made by the line companies on the same properties, and that no trouble has been experienced on this score.

The feasibility of forming a New York State Insurance Company was considered. The desirability of having such company organized was recognized, especially for the use which might be made from it in extending the membership of the association. The fact was brought out that members of the New York association may obtain insurance in the National Company, and also in the insurance companies in connection with several of the State associations. With a view of informing the members of what is feasible in this direction, the following resolution was offered by R. R. Williams and unanimously adopted:

Resolved, That the Executive Committee be requested to put before the members of this association in condensed printed form information in regard to what is permitted the members of this association in the way of obtaining fire insurance in the National Hardware Dealers' Mutual Fire Insurance Company and in the insurance companies in connection with retail Hardware associations in the various States.

Resolved, That they take such measures as they may deem advisable to secure legislative action if necessary for the organization of a retail Hardware fire insurance company in this State.

Other Resolutions.

The following resolutions were unanimously adopted:

Resolved, That we recommend to the National Retail Hardware Dealers' Association the careful consideration of what can be done to have the privileges of insurance in the National Hardware Dealers' Mutual Fire Insurance Company and in the insurance companies of the several States limited to Hardware merchants who are members in good standing in their State associations, provided they are residents of a State where a retail Hardware association exists.

Resolved, 1, That this association recognizes with satisfaction the manner in which the interests of the retail Hardware trade were represented at the conventions of the National Hardware Association and the American Hardware Manufacturers' Association at Atlantic City in November last, by the presence there of W. P. Bogardus of the National Retail Hardware Dealers' Association, and M. L. Corey, secretary of the same association.

Resolved, 2, That inasmuch as there are many matters directly affecting the welfare of the retail trade which are connected with those of the manufacturers and jobbers, in regard to which there might advantageously be conference between these three great classes of the trade, we respectfully put it on record that it appears to us desirable that such representation of the National Retail Hardware Dealers' Association be hereafter a regular feature of such national Hardware gathering, if agreeable to said organizations of jobbers and manufacturers.

Resolved, 3, That this action is taken in the interest of harmony and that there may be the most fraternal relations between manufacturers, jobbers and retailers, based on a marked recognition of the rights and privileges of each of these great divisions of the trade.

THURSDAY MORNING SESSION.

At the opening of the Thursday morning session, John M. Ives, secretary of the Rochester Chamber of Commerce on behalf of its president, Thos. B. Dunn, gave the convention a cordial welcome to its rooms. He explained that President Dunn had expected to extend the welcome in person, but was detained at home by sickness. He however had sent some boxes of cigars which Secretary Ives passed around to the members. R. R. Williams of *The Iron Age* tactfully replied to Mr. Ives' remarks.

A rising vote of thanks was given to the Chamber of Commerce for its kindness, and the use of the Chamber of Commerce rooms.

President Hallowell read a letter from Geo. H. Sargent, extending his best wishes to the association. He was unable to attend.

Secretary Taylor's Report.

The annual report of the secretary was as follows:

In submitting my second annual report I wish to extend my thanks to our President, Mr. Hollowell, for courtesy and consideration to myself, and also to the Executive Board for their kindness and support to what was deemed the best interest of this Association. They have given their time, and been to considerable expense to attend the two Executive Board meetings during the year, and if there is any criticism to be made as to the results and the work done the Secretary alone is to blame. But as our time is valuable I wish to narrate as briefly as possible the work of the year.

It has been the aim of this Association to increase

LOUIS J. ERNST, Second Vice-President.

its membership as much as possible. Along this line I have sent several circular letters to every merchant in this State. As a result 22 firms have responded, and their names have been added to the roll. In each case I have sent these members a certificate of membership with the seal of the Association, and it is hoped by the officers that these certificates may be found in a prominent place in their offices.

As the president has covered considerable of the work of the secretary, my report will be brief and will only touch on a few subjects that seem to be vital.

ONE OF THE MOST SUBSTANTIAL BENEFITS THIS ORGANIZATION AFFORDS ITS MEMBERS

is the privilege of carrying fire insurance in the National Retail Hardware Dealers' Insurance Company and also in State companies at a saving of perhaps one-half the cost of the board rate. These can be had by applying to the secretary. I wish to add that Mr. Bogardus, president of the National Retail Hardware Dealers' Association, a man who has been eminently successful in his own business and is hold in high esteem wherever known as a conservative and conscientious business man, heartily recommends the management and plan of the National Retail Hardware Dealers' Insurance Company, which high authority certainly commends the plan to our careful investigation with a view to a profitable investment by applying for a policy in the company.

PARCELS POST.

Let us not lose sight of the threatened Parcels Post bill, whose passage means so much to that octopus, the catalogue house, and destruction to the great army of the retail dealers throughout the country. If its passage is defeated it will be through the efforts of the Retail Dealers' Association, supplemented by the aid of the Jobbers' and Manufacturers' associations, with most of the honor due the Retail Hardware associations through their National Association.

AN IMPORTANT PROBLEM.

The fact that many eligible dealers persist in remaining out of the associations that are striving to make their business more profitable and pleasurable is a problem with which all associations have to deal, and ours is no exception. How to get these parties in the association is one of the questions I hope may be freely discussed in this convention. We need them both, for their money and their influence, and I hope some effective means of reaching them may be devised.

A considerable portion of the secretary's time was taken up in getting up a fairly good mailing list, and we trust that during the coming year we will be able to reach all the Hardware dealers in the State.

There are about 2000 Hardware merchants in this State outside of the Island of Manhattan, and there is no good reason why they should not become members of our association. Last year we numbered 124; this year there have been added to the list 22. Eight firms have signified their intention of withdrawing from the association. There have been two deaths, H. M. Sponenburg of Watertown, and O. D. Towne of Saratoga Springs. Two have sold out or retired from business. I have not been able to get any response from 26. I think it is probably from oversight—think they would send their remittance on the morrow, but that day never comes. The total membership is 150, and it is hoped that all present will join us in the good work. As I have held this office for the last two years, with many pleasant remembrances of all, I am glad to retire in favor of my worthy successor, trusting the work begun will continue until the retail merchant can say all is well.

On the conclusion of his report Secretary Taylor explained that as he is about to become a manufacturer he cannot very well be carried as an active member, and requested that his name be transferred to the honorary list. President Hallowell told of Mr. Taylor's work in organizing and carrying on the association, and gave him much credit for what had been accomplished. Mr. Taylor was then unanimously elected as an honorary member. Later he was elected as an active member, and Herbert M. Williams of *The Iron Age* as an honorary member.

Auditing Committee Report.

Louis J. Ernst, chairman of the Auditing Committee, made the report for his committee, combining with it the report of Treasurer F. E. Pelton, whose accounts were audited and found correct.

Secretary Taylor then read an interesting report as alternate delegate to the National convention, held last March.

Election of Officers.

The Nominating Committee reported the following officers, who were unanimously elected:

PRESIDENT, John G. Ferres, Johnstown.
FIRST VICE-PRESIDENT, C. P. Sherwood, White Plains.
SECOND VICE-PRESIDENT, Louis J. Ernst, Rochester.
SECRETARY, John B. Foley, Syracuse.
TREASURER, F. E. Pelton, Herkimer.
DIRECTORS FOR THREE YEARS: L. G. Mattison, Newark; J. J. Douglas, Binghamton, and Clark Bloss, Dunkirk. W. D. Hollowell of Penn Yan was also elected a director, to take the place of John B. Foley, the new secretary.

A telegram was sent to the new president, John G. Ferres, who was sick at his home in Johnstown, advising him of his election.

On motion by Mr. Matthews a unanimous rising vote extended the thanks of the association to all the retiring officers for their efficient efforts and labors performed.

Resolutions.

Mr. Foley, as chairman of the Committee on Resolutions, presented the following resolutions, which were adopted:

Resolved, That the sympathy of the organization be extended to the families of Messrs. O. D. Towne of Sara-

toga Springs and H. M. Sponenburg of Watertown, whose deaths occurred during the past year, and whose advice and encouragement we will miss in our work.

Resolved, That the thanks of this meeting are due to and are extended to the Mayor of Rochester, who graciously welcomed this body to the city of which he is the honored head, and to the Chamber of Commerce and to the press of Rochester for their courteous attention and fair reports of the association's deliberations; to the manufacturers and other guests who addressed the meetings for their kind attendance and evident interest in our body; to the retiring officers of this association, whose active work is so manifest from the good work already accomplished, which we trust will grow to great proportions as a tribute to their sacrifices and labors.

Referred to Executive Committee.

Charles P. Sherwood reported for the committee, on accepting commercial men into the association, that it did not want to decide this question on such short notice, and, on motion, this matter was referred to the Executive Committee to consider at its leisure and report at pleasure.

Buffalo Next Year.

After some discussion Buffalo was decided upon as the place for the next meeting, the time for which was left to the decision of the Executive Committee.

Delegates to National Association.

W. D. Hollowell and John G. Ferres were elected delegates to the National Association. The new secretary, J. B. Foley, was elected another delegate to the National Association, and the president given power to appoint his alternate in case he is unable to attend.

J. B. FOLEY, Secretary.

Mr. Foley then moved that R. R. Williams, who, he said, was a Hardwareman through and through, be transferred from honorary to active membership in the association, the dues and assessments being remitted for all time. Mr. Williams said he would be glad to accept the honor if he might be permitted to pay the regular dues like other members. He was then unanimously elected an active member.

The Executive Committee was given power to appoint two more alternates for the National Association.

Secretary Taylor was then called out of the room, and Allen S. Matthews suggested that some token should be given to the retiring secretary in recognition of the faithful and sacrificing services he had rendered. The members then contributed to a fund for that purpose, and Allen S. Matthews and Louis J. Ernst were appointed as a committee to purchase an appropriate gift.

The Parcels Post.

The proposed Parcels Post bill was explained in a clear and forcible manner by M. L. Corey, and its various features touched upon in the discussion which followed. As expressive of the sentiment of the association the following resolutions were unanimously adopted:

Resolved, That this association disapproves of the Parcels Post bill now before Congress, regarding it as impracticable and entirely wrong in principle, as it encroaches unduly on the field of private enterprise, and in the interest of a special class would curtail a vast outlay of the public moneys.

Resolved, That the secretary be directed to send the Congressmen and Senators of the State a copy of this resolution.

THURSDAY AFTERNOON SESSION.

At the Thursday afternoon session the Question Box was opened and some interesting thoughts were brought out in the discussion that followed, a part of which is summarized below:

Question Box.

Is it fair and just for a jobbing house, through a traveler who sells the regular Hardware dealer, to sell the same line to a grocery store in same town?

A member said that he did not approve of such a thing and that whenever it happened a report should be made to the secretary, who will bring the matter before the jobber. Very frequently the retailer can in this way promptly put a stop to this practice.

Another member suggested that a jobber will sometimes sell to the grocer when the Hardwareman will not buy from him. He suggested that in some cases, when a jobber goes too far in this direction, he might be reported to other dealers as "unfair."

What are the benefits of local associations?

One member said that the most practical results in the local association to which he belonged came from the collecting it did. Three letters are sent to delinquents. The first two ask for payment in a polite but firm manner. If these are not answered, the third, printed circular, letter is sent. This tells the delinquent that he will be unable to secure credit from members of the association until the account is settled, and is signed with the names of the members, comprising nearly all the dealers in the town. Some little trouble was experienced during the first year by some members not living up to the agreement not to give credit to delinquents, but this was overcome when a resolution was adopted by the association by which the members pledged that they, their families and clerks would only trade with firms living up to the rule. After that everything went smoothly. They collected over 60 per cent. of bad debts, some of which were outlawed and most of them considered absolutely worthless. He considers the association one of the greatest benefits that the town has had. In addition to the collecting feature, the association has brought about the closing of all stores at 6 o'clock, except on Monday and Saturday nights.

Another member told how jealousy between members of a local association had handicapped its efficiency for some time; how some joined for what they could get out of it, and were unwilling to give anything in return. Four members were willing to tell all they knew, and the others simply listened. Since then the members have found out that it is to their advantage to help along the association, and to give it their active interest and support. It is to-day a vigorous organization, and interests itself in every town project that comes up. Regarding collecting, he explained that two notices are sent, and those paying no attention to them are notified that their account will be advertised to be sold at auction. This notification generally brings them to making some arrangement about paying.

Mr. Corey said that the idea of local organizations was being pushed more and more each year in the West, and that when the members are willing to stand by their agreements great benefits can be derived.

What is the maximum time that credit should be given by the retail Hardware trade?

In connection with this question came up the subject of cash discounts. Many of the members intimated that as a general rule they would be well pleased to give 5 off for cash. Several thought that the size of the discount, whether 2, 5 or 15 per cent., made but little dif-

ference to the average customer, very few of whom really appreciate and figure what it really amounts to.

A member told the story of a woman to whom he offered 5 off on an article marked $19. She said she would think it over. The next day she returned, accepted his terms as she thought, and counted out $14.

One of the largest dealers in the State explained that in 15 years his loss from bad debts was ⅜ of 1 per cent., and that he would rather do a credit basis on this average than give a cash discount.

The method of Mr. Scott of McConnellsville, Ohio, who does a strictly cash business, with the exception of three accounts he runs for the town and county purchases, was described by H. M. Williams.

A retailer in Vermont was then referred to who for 40 years has been doing a strictly cash business with success.

What can be done with Lumber dealers who are carrying stocks of Hardware?

A member, in reply to this question, told of a jobbing house that sells to blacksmiths and wherever else it can. The attention of the manufacturer of one of the lines sold in this way was called to the fact that his goods were being sold outside of the legitimate channels. The manufacturer wrote the jobber and requested that, as he had Hardware customers in that locality, he stop selling

L. G. MATTISON, Director.

the blacksmiths. A letter to the manufacturer often has good effect.

Does a slack credit system encourage mail order business?

The concensus of opinion was that it does, and that the average farmer or mechanic, when in debt in town, will go out of town and buy for cash.

Is there any one who has used loose leaf ledgers, and with what success?

Few of the members appeared to have used them, but those who had expressed themselves as well pleased and unwilling to go back to the old system.

What is to be done to restrain the disturbing influence of retail jobbers, &c., who do not hesitate to make the same or better prices to contractors and reliable consumers than they do to the retail dealer?

It was suggested that the evil might be abated by a circular sent by the Executive Committee to each member of the association, giving the names of such retail jobbers, and requesting that members place their orders with legitimate jobbers and manufacturers. Also that a circular be send to the offending jobbers, clearly stating that they cannot expect the patronage of the association without fair dealing to its members. This interesting question was referred to the Executive Committee.

Should we prefer jobbers' or manufacturers' brands on goods we buy?

The members seemed to think that the manufacturers' brands are always to be preferred, and that those of the jobbers are of cheaper quality.

Presentation to Mr. Taylor.

At this point Allen S. Matthews walked into the room with a dress suit case and umbrella in one hand and in the other a magnificent bronze statue of a fisher maiden. These he placed on the table on the platform, and called up Secretary John R. Taylor, whose work, he said, could not be measured in dollars and in cents. He had started the ball rolling, and had done more hard work and spent more hours in thought to make the association a success than any other man. He then presented the dress suit case, umbrella and statue to Mr. Taylor, with a few more words that brought tears to many in the hall.

Mr. Taylor thanked the members most heartily for their unexpected gift, and said that the taking off the harness does not mean that he will do no more work for the association, but he assured the members that he will always do all he can for it.

Adjournment.

The convention adjourned after what was regarded by all as an exceedingly useful and enjoyable gathering.

RETAIL ADVERTISING.

BY A. EUGENE BOLLES, "HARDWARE," NEW YORK.

Some are born great, some have greatness thrust upon them, others advertise. The merchant who sits down and waits for business to come to him will find himself among the leftover baggage when the Empire State Express of business success pulls out.

Business success needs three things—knowledge, push and good advertising. In these strenuous times advertising bears about the same relation to a business as steam does to an engine, or, rather, as the fire under the boiler to the steam it creates. Advertising alone will not make a millionaire out of any man. It is the pinch bar with which a live, hustling man may make a business move with little perceptible power.

ADVERTISING ISN'T AN ART;

it's just applied common sense. Advertising is naturally a creative force. Since it has been applied to modern commerce, there have been created dozens of commodities and branches of trade that did not exist before its advent. The $600,000,000 spent annually in this country for publicity have set many hundreds of millions of dollars running into wholly new channels. Business is warfare—in a sense, a hard, constant fight to the finish. Advertising is the business man's most modern, most effective weapon. Once in a while we hear some old fellow saying, "I have never advertised, and am still doing business at the old stand." He means that he is doing business at the old standstill.

Advertising is the yeast cake which causes the business bread to rise. Advertising is simply telling some person or persons some fact or alleged fact concerning something. It is, therefore, as old as the human race, for didn't the serpent by his plausible arguments induce Eve to pick the apple, and after tasting it didn't Eve tell Adam it was good and persuade him to take a bite? In olden times the Greek merchant was accompanied on his rounds by musicians, who assisted him in chanting the virtues of his wares. In a ruin of ancient Egypt was found written on papyrus an advertisement for a runaway slave. This advertisement is undoubtedly at least 3000 years old.

It has always been a wonder to me that advertising in different ways was not more general among Hardwaremen, for it seems to me that the modern Hardware store, with its thousand and one specialties and articles of general use, presents one of the easiest advertising propositions in the field of business. Our grandfathers' stock, made up as it was chiefly of Nails, Butts and Screws and the like, would have made rather a difficult subject for even an expert ad. man to handle; but the Hardware stock of to-day, with fancy Builders' Hardware, Cutlery, Sporting Goods and almost an endless

number of specialties for the housewife, farmer, children and grown-ups, offers material for a dozen or more good advertisements for every day of the year.

When once you decide to commence advertising don't spend a dollar for printer's ink, paint or posters until you are ready for results. You wouldn't invite a lot of people to your house to partake of a Christmas dinner and when they arrive have no fire in the parlor and no dinner to serve. An advertisement is an invitation to the people of your neighborhood—all of them—to come to your store and see something worth the trip, so, in the language of the Scriptures, "put your house in order" first; make your store attractive. It will cost something, but you can't expect people—especially new customers—to come a second time unless you give them the right kind of a reception when they make their first visit.

PUT YOUR MOST ATTRACTIVE, MOST SEASONABLE GOODS TO THE FRONT.

New customers will not be favorably impressed if on coming into your store they run against a lot of Shovels, Wheelbarrows, Nail Kegs and the like. Every Hardware

JOHN R. TAYLOR, Ex-Secretary.

store keeps those goods, and if any one wants them they will ask for them. Put your Cutlery, small Tools and other bright goods in the front, where daylight will strike them. Arrange your Stoves in neat rows and keep them polished. Keep your newest specialties in conspicuous places, exhibiting working models where possible, so that each one will tell its own story. Put your Nails and other homely goods out of sight, and you will have a store that says "Welcome" to all who enter and "Come again" when they leave.

Study your trade and buy the goods it demands, and don't buy second-class goods. Goods that are not good enough to bear truthful advertising are not good enough to sell—or even to give away.

Study your goods, and see that your clerks know just as much about them as you do. If you started a man out to canvass the town for orders for a new Washing Machine you wouldn't allow him to commence soliciting orders until you were assured that he knew the strong talking points of that machine. It is just as important that you and your clerks know every strong argument concerning the hundreds of articles on your shelves and counters. This means work, but no half-hearted policy will bring success.

I wonder if there is not some one here who expected me to say: "Then call in the advertising expert with his hand-me-down ads." If so, you will be disappointed. The average advertising expert, the man of whom it is said—

> The time is past when poets starve
> In garrets without hope;
> They're making scads by writing ads.
> For breakfast foods and soap—

this man is about as much use to the retail Hardwareman as a refrigerator to an Esquimau. A knowledge of the goods and of local conditions must be possessed by the man who successfully advertises a Hardware store.

There may be some others who expected me to insist that a course with a correspondence school of advertising is absolutely necessary. Again you are doomed to disappointment—at last, partially so. Of course, a knowledge of type, engraving, arrangement, &c., is certainly a valuable asset to the writer of advertising, but there are many successful advertisers who do not know 6-point old style from 36-point Gothic or a printing press from a paper cutter. A few dollars spent in subscribing to one or two magazines devoted to advertising will furnish you with all of the technical information necessary.

THE HARDWARE DEALER CAN ADVERTISE IN AN ALMOST ENDLESS NUMBER OF WAYS,

but I will mention only those that are in my opinion first in importance and productive of best results. I have already spoken of the advisability, rather the necessity, of having an attractive interior to the store as a method of *holding* trade, and as one of the first methods of *attracting* the attention of the passer-by—the man on the outside—I wish to say a word about the store's exterior.

You or I might have walked over the hills of Cripple Creek, stumbling over the rocks, and think those barren hills one of the last places on earth from which man could have gained a living. The man of minerals comes along, picks up the stones we have stumbled over, crushes and smelts them, and carries away millions in gold. He knew what was inside of those rocks. The Hardwareman is dealing with people who don't know what is inside, so he must put a little glitter on the outside to excite the curiosity of the passer-by. The exterior of the Hardware store should say "Come in" to every one in sight, just as the interior should say "Welcome" and "Come again."

In dressing windows the same arrangement should prevail as in the main part of the store. Don't fill the windows with prosey, staple goods; you don't need to tell people that you keep these goods; fill your windows with attractive articles; make your windows talk; display seasonable goods in a way that will suggest the need of them in the minds of the people who see your windows; keep the display bright and clean and change it frequently; keep the people wondering what you are going to do next, but look out for the nonsenical. The merchant who does some fool thing to draw a crowd generally gets it, but such a crowd produces only a few unstable customers, and for every one such customer gained in this manner a dozen would-be customers turn away with a feeling of mingled contempt and disgust.

CIRCULARS AND BOOKLETS.

Another mode of advertising which can be carried on with little expense is the use of circulars or booklets. Much good material for this kind of advertising can be obtained practically without cost. The manufacturers of specialties in many cases furnish the dealers with circulars or booklets describing their articles. At a small expense your name can be printed on these, or a rubber stamp can be used. Never let a piece of advertising matter leave your store until your name is on it. Whenever you put in a stock of Stoves, Refrigerators or any other seasonable goods have an attractive circular printed announcing the fact. Cheap printing is too expensive, it doesn't bring business. Really good printing means a larger printer's bill, but it also means more sales.

One very good method of distributing circulars or booklets is by placing one in each package of goods sold. A little good judgment is necessary in this, for profitable results could hardly be expected from a circular describing boys' Skates if wrapped up with a Flour Sifter sold to a maiden lady of uncertain years, or a Lawn Mower booklet given to a section hand who resides in a railroad shanty. This method of distributing will, of course, reach only your present customers. To reach others necessitates either a house to house distribution or the use of the mails. Sending circulars by mail costs more, but, like good printing, it invariably brings much better results, and more than this it permits classification. If you put

in a new line of Carpenters' Tools send advertising matter concerning them to all the carpenters in town. If a new line of Sad Irons, send the booklets or circulars to the housewives. It is said that a man always hits what he aims at, but that the reason for so much poor shooting is that the shooters don't aim. A man with a blunderbus uses 1 pound of lead, and is pretty sure to hit something, but a steady hand behind a Rifle loaded with a ½-ounce bullet is even more effective, and, besides, it saves Ammunition.

Painted signs nailed up along country roads and advertisements painted on fences, barns, &c., will make the rural population acquainted with your name and business. Little or no argument can be made in advertising of this character, but, considering the length of time during which these signs remain standing and their moderate initial cost, money spent in this direction is generally considered well invested.

NEWSPAPER ADVERTISING.

I have now reached that most modern medium for advertising, the one accepted by leading authorities as the best. I refer to the newspaper. Being a newspaper-

WEBSTER R. WALKLEY.

man, it is natural that I would favor this class of advertising. However, I hardly imagine that I will be accused of partiality, considering the recommendations I have already made for spending a large part of the advertising appropriation in other directions. I have left what I have to say concerning newspaper advertising to the latter part of my remarks, because success in newspaper advertising depends to such a great extent on preparation—on the advertisers' being ready to care for results. The other methods that I have suggested are really part of this preparation.

The first and one of the most important steps in newspaper advertising is the selection of media. In small towns this is a small item, especially where there are only one or two newspapers. In larger towns, with a half dozen dailies and twice that number of weeklies, it requires exceedingly good judgment on the part of the advertiser to place his appropriation to the best advantage. The politics of a paper should never, in my estimation, enter into the consideration. It is not at all likely that your customers and possible customers are confined to one political party. Other things being equal, I should select the evening paper in preference to the morning paper for advertising Hardware, for the reason that the evening edition is the one most generally read by the housewife and by the laboring man; both are too busy in the early part of the day to more than glance at the morning paper at the breakfast table, while the evening edition is read by the family around the fireside.

If you have a number of papers from which to make your selection, try to pick out the papers which reach your trade—that is, if your trade is largely among laboring men, get into the laboring man's favorite. If your trade is general in character, it will be necessary to add a paper favored by the better classes. You can decide on this matter after a personal investigation on a small scale as to the popularity of different publications. The rural population should not be overlooked. To reach them use the best weekly papers, or, if the surrounding country is covered by rural free delivery, find out what daily papers the farmers subscribe to most generally, and use them.

Honest advertising solicitors can assist you in making selections—and here let me say just a word concerning the representative of the newspapers' advertising department—if he knows his business the average solicitor can give you many pointers, can tell you many things you don't know. When he makes his first call receive him courteously; if he seems honest, conscientious and experienced, receive him with equal courtesy when he calls again. Advertising men, like Hardware drummers—and, in fact, like all salesmen—are sometimes tempted to draw the long bow, but on the whole, take the average, and you will not be able to find a more industrious lot of men. Quick in perception, ever ready with suggestions, broad-minded—you will find the honest advertising man of experience a valuable friend.

THE SIZE OF SPACE TO BE USED

is another important item. Use space enough to present at least one strong argument. Large space is unnecessary, except in the event of special sales or at the opening of a season. A space from 3 to 8 or 10 inches, single column, filled with an argument straight to the point on one subject, changed every day, or at least three times a week, if inserted in daily papers, will bring more business for the money expended than a half page crowded with a disconnected jumble of different articles. Let the story you have to tell decide the size of space. State your argument as pointedly, as briefly as possible, have it set up in readable type, and if it takes 3 inches, that's enough, if 10 inches, use ten. A 10-inch ad. in a 3 inch space is about as much out of place as a 300-pound man in his boy's express wagon. Too many advertisements are spoiled by overcrowding, and to cut the ad. short, to leave out essential points, to stop before the story is complete, spoils the ad. just as surely as crowding it. Of course this applies to "all year round" advertising. During the holiday season or when you receive your Spring goods or on other similar occasions, a forcible announcement in a large space is advisable. The larger the ad. the more care necessary in arrangement. An advertisement which looks like a Chinese puzzle won't have many readers, and you can't expect the dear public to get out an extra pair of spectacles in order that they may learn what you have to say.

WRITING ADVERTISEMENTS.

The best article ever made, advertised in the best medium ever published, will not bring results unless the advertisement is properly written. This is the rock on which so many advertising ships have been wrecked and the current which carries them to disaster is named "Big Words."

An old Irishman used to say, "foine words butter no parsnips"—highfaluten talk won't bring business. Human talk is what is wanted. When the rubbish is cleared away and we get down to the rock bottom, this advertising business is as simple as A. B. C. A whole band wagon full of college-bred theories can't compete with a hard-headed business man with a stub pencil and a sheet of wrapping paper in getting up good ads. Plain human talk is what you want—the kind that talks square toed English, with no frills put on. If in the ordinary explanations a joke creeps in naturally, it is splendid stuff—helps to set off the ad. and gives it that real human touch that brings buyers.

Get out your stub pencil and a big sheet of manila wrapping paper. Write just the same as you would holler to a fellow across the street: "Come over here Jones and see the finest article you ever saw in a Hardware store." When he comes over, you go into detail, tell him all about it and why he needs the article.

A firm belief that your business is worthy of patronage is the first essential to the writing of good advertise

ments, and the man who can forget that he is writing and talk with his pen as he would under ordinary circumstances will get the trade. Advertising experts prepare barrels of high sounding ads., but when it comes to getting trade for the Hardwareman no one has ever improved on the good old fashioned way of telling the plain facts in an intelligent, straightforward manner.

THE AD. THAT DOESN'T CONTAIN INFORMATION

is not the business bringing kind. It is a mistake to presume that the public is familiar with the goods you carry. In writing ads. it is a good idea to presume that people generally know nothing at all about your business or the goods you sell, and that it is your especial duty and privelege to enlighten them. The man who knows his trade and knows what it wants and knows how to intensify its wants by suggestive advertising will always be in the front seat of the business band wagon.

Make your ads. to the point, don't be ambiguous or you may find yourself in the predicament of the young lady who inserted an advertisement to the effect that she would like to meet a gentleman fond of outdoor life. The ad. was answered by a score of hoboes.

A customer recently called at a grocery, and said to the proprietor: "I believe that you advertise your establishment as a real live grocery." The grocer, with a large, open faced smile, replied: "You have said it." "Well," continued the customer. "Your ads. are certainly truthful, for the cheese I bought here yesterday was about the liveliest thing I ever encountered."

ADVERTISING SOMETHING YOU HAVEN'T GOT

is like writing checks when you have nothing in the bank—there will be trouble when you don't make good. This reminds me of another cheese story. A man said to a grocer, "What's the price of cheese to-day?" "Fifteen cents a pound." "But the fellow across the street is selling it at 10 cents." "That's the place for you to buy it." "But I've just been over there and he hasn't got any." "Well, then, the kind of cheese I haven't got you can have at 10 cents a pound also."

Jokes and smart aleckness are as much out of place in your ads. as a cakewalk in a cemetery, and, as one bad egg spoils an omelet, so one bad ad. may spoil the effect of a whole series.

Don't imagine that people are standing around with open mouths and ears to catch everything you have to say. You've got to say it so attractively, so earnestly, so boldly that they'll see it in spite of preoccupation or indifference.

A well written ad. will not be read unless it is properly set up by the printer. The heading of an ad. should tell a story in itself, or be so inviting as to lead the reader immediately into the body of your announcement. Just one display line in a plainly set ad. attracts the eye more quickly than a hodge podge of bold face and italics.

The store that runs a headline reading "Fire Sale," "Grand Opening," "Slaughter Sale" or "Unprecedented Sacrifice Sale" every day soon takes rank with the boy who cried "Wolf," and the "Bankrupt Sale" often closes the chapter.

Enthusiasm without cool judgment is liable to blow in the appropriation on one or two insertions. It takes time, repetition and common sense arguments to make people believe in and buy your goods and come back for more. Too many advertisers empty their appropriation sand boxes on the first grade, and the road to advertising success is strewn with the bleaching skeletons of the victims of one insertion. John Wanamaker once said, "To discontinue advertising is like taking down your sign." You have a sign above your door to let people know who you are and what you are doing. That's what your advertising does. It merely multiplies your sign. It lets thousands of people know what you have to sell.

VANITY IS TOO FREQUENTLY THE BESETTING SIN

of the business man. They labor under the delusion that if they advertise during the few busy months the public will keep them in mind for the remainder of the year. They overlook the fact that when the mightiest of earth pass away people cease to talk or think of them after a week. Only a few years ago the name of Paul Krueger was in every man's mouth; everybody talked of him, applauded him or criticised him—wondered what his next move would be. How often do you think of him now? How many of you know that in a little European village this old man, broken in body and spirit, once famous, now almost forgotten, is passing his few remaining days dependent on the hospitality of friends?

So it is with the business man—in order to be in the public mind his name or his business must be kept before the public all the time. Advertising loses one-half of its efficacy when put out spasmodically.

LIST OF MEMBERS.

ALBANY.
G. V. & F. W. Cameron.
Waterman Hardware Company.

AMSTERDAM.
Frank S. Dean.
John E. Larrabee.

ATLANTA.
W. E. Waite.

AUBURN.
P. M. Herron & Co.
Hiram J. Rich.
Smith & Pearson.
Choate Bros.

BALDWINSVILLE.
J. S. Voorhees & Co.
J. C. Williams.

BERGEN.
Gleason & Gillette.

BOLIVAR.
H. L. Zimmerman.

BINGHAMTON.
Callahan & Douglas.

BROCKPORT.
Charles Decker Company.

BUFFALO.
George B. Allen.
Charles L. Steininger.

CANASTOTA.
Farr Bros.

CAMDEN.
W. H. Dorrence & Son.
L. P. Smith.

CASTILE.
Cole & Andrus.

CATO.
Hapman & Van Dusen Company.

CHAMPLAIN.
T. H. Dickinson & Co.

CHATEAUGAY.
Skinner & Ottoway.

COBLESKILL.
Irving Van Voris.
Willard Larkin.

COHOES.
Burbanks Hardware Company.

CORNING.
Frost & Williams.

CORTLAND.
F. D. Smith Hardware Company.

CUBA.
Sisson & Smalley.

DANSVILLE.
J. J. Bailey & Son.

DE KALB JUNCTION.
G. A. Sheldon.
N. D. Walker.

DELHI.
H. S. Graham.

DESPATCH.
Geo. Cross.

DUNDEE.
C. J. Biglow & Co.

DUNKIRK.
Charles Bloss Company.

ELMIRA.
C. W. Youngs.
Plowman Hardware Company.
Griswold, Maloney & Co.
H. P. Minor.

FARMER.
C. F. Case.

FORT COVINGTON.
Allen S. Matthews.
Farquhar Bros.

FORT PLAIN.
Stewart & Bergen.

FULTON.
A. J. Snow.
George Johnston.

FLUSHING.
E. A. Perpall.

FONDA.
Janson & Huestis.

GASPORT.
French & Rim.

GILBERTSVILLE.
Wm. H. Stockwell Estate.

GILBOA.
Frank R. Thomas.

GENEVA.
Dorchester & Rose.

GLOVERSVILLE.
E. J. Durkee & Co.

GREENWICH.
Parker & Cleveland.

HAMILTON.
Smith Hardware Company.

HANNIBAL.
J. & P. McFarland.

HERKIMER.
C. W. Palmer & Co.

HILTON.
Edison Tabur.
Prowse & Pelton.

HOMER.
F. S. Williams.

HERMON.
W. C. Popple.

HUDSON.
J. C. Rogerson & Co.

ILION.
Grimes & Pelton.
M. J. Newth.

ITHACA.
C. J. Rumsey & Co.
Barr Bros.

INWOOD.
Henry Crocker, Jr.

JOHNSTOWN.
John G. Ferres.
Frank Miller.

KATONAH.
Kellogg & Mead.

LEONARDSVILLE.
Crandall & Coon.

LIMA.
C. R. Gray.

LITTLE FALLS.
Burney Brothers.
John R. Taylor & Co.
Geo. D. Gibbs.

LONG ISLAND CITY.
John W. Petry.

LYONS.
A. E. Marshall & Co.

MARGARETVILLE.
B. F. Searle.

MECHANICSVILLE.
J. C. Safford & Son.

MEDINA.
Acer & Whedon.
Hanlon Bros.

MIDDLESEX.
C. C. Shepherd.

MASPETH.
Inglis Bros.

MORAVIA.
Fred. Small & Sons.

MIDDLEPORT.
E. B. French.

MOSCOW.
King & Eddy.

NEWARK.
C. E. Leggett.
L. G. Mattison.

NORTH TONAWANDA.
F. F. Wagonschultz & Co.
H. B. Koenig & Co.
Knapp Hardware Co.

NEW PALTZ.
P. M. Hood.

NEW YORK MILLS.
M. E. Hastings.

NIAGARA FALLS.
F. W. Oliver & Co.

NEW YORK CITY.
R. R. Williams.

OAKFIELD.
A. B. Rathbone.

OGDENSBURG.
John Barr.
J. Stacey Sawyer.
W. D. Britton.
Patrick Hackett Hardware Co.

ONEONTA.
Stevens & Baker.
Charles E. Hills.
L. H. & C. D. Townsend.

OVID.
W. W. Payne.

OLEAN.
Miller Hardware Company.

OSWEGO.
Oswego Hardware Company.
Reid & Co.
Smith Hardware Company.

OWEGO.
J. S. Houk.

PENN YAN.
Hallowell & Wise.
F. S. Plaisted.

PERRY.
Olin & Grieve.

PORT HENRY.
J. T. Breadner.
PORT JERVIS.
Swinton & Co.
POTSDAM.
Contryman & Co.
Frank A. Weed.
Maxfield & Needham.
POULTNEY.
W. E. Cook.
RICHFIELD SPRINGS.
Buchanan Hardware Company.
ROCHESTER.
Louis Ernst & Sons.
J. Sage.
H. H. Maxson.
Leon Du Bois.
Henry Lester.
ROSENDALE.
Rufus Snyder.
SCHENECTADY.
Teller & Stanford.
J. V. Vrooman's Sons.
SCHENEVUS.
R. C. Mills.
SINCLAIRSVILLE.
Reed & Co.
SPRINGVILLE.
H. Curtis.
SYRACUSE.
John B. Foley & Co.
Dotterer & Becker.
F. H. Eberling.
SARATOGA SPRINGS.
Towne Hardware Company.
F. W. Gardner.
STAPLETON.
Frank Webber.
SPENCERPORT.
F. W. Spencer.
TICONDEROGA.
Frank L. Brust.
TROY.
H. D. Hull.
TURIN.
H. M. Riggs, Agent.
UTICA.
Shaughnessy Bros.
WATERVILLE.
W. C. McLane & Co.
WEBSTER.
H. C. Bergh.
WELLSVILLE.
Hoyt Hardware Company.
F. B. Boyce.
WHITE PLAINS.
C. P. Sherwood.
Fowler & Sellars.
WALCOTT.
W. W. Paddock & Sons.
WARSAW.
Ballentine Hardware Company.
Webster-Case Hardware Co.
YONKERS.
Lewis H. Wiggins & Sons.
HONORARY MEMBER.
New York City, H. M. Williams.

MANUFACTURERS AND OTHER VISITORS.

PETERS CARTRIDGE COMPANY, Cincinnati, Ohio: George W. Benjamin, with Eastern department, 80 Chambers street, New York, entertained members in his room, and gave as souvenirs cartridge stick-pins and also celluloid buttons.

PITTSTON STOVE COMPANY, Pittston, Pa.: J. P. McKaigh.

DOVER MFG. COMPANY, Canal Dover, Ohio: A. S. Howe entertained the members in his room, and gave small asbestos sadirons as souvenirs.

YALE & TOWNE MFG. COMPANY, 9-13 Murray street, New York: L. A. Wegman had a good line of samples in Builders' Hardware and Padlocks, and held a constant reception in his large room. He gave Y. & T. key stick-pins and a very neat and attractive ash receiver made of cast brass.

CHARLES G. ALLEN COMPANY, Barre, Mass.: Charles G. Allen.

SUMMIT FOUNDRY COMPANY, Geneva, N. Y.: Frank Huntington Matthews.

READING HARDWARE COMPANY, Reading, Pa.: H. A. Fisher, Jr.

E. C. ATKINS & Co., Indianapolis, Ind.: N. E. Huggins, from the New York office, gave as souvenirs steel foot rules, pocket combs, saw stick-pins and whetstones.

SARGENT & Co., 149-153 Leonard street, New York: Scott C. Ball.

JEWETT & Co., Buffalo, N. Y., represented by Josiah Jewett, Jr., manager; S. H. Gibson and C. S. Briggs, had an exhibit in which were shown two Jewett Elk Steel Ranges and one Jewett Reflex Gas Heater. Pencil souvenirs were given to callers.

NEW JERSEY WIRE CLOTH COMPANY, Trenton, N. J.: S. McClelland gave handsome pocketbooks to customers and friends.

LANDERS, FRARY & CLARK, New Britain, Conn.: E. L. Bigelow demonstrated the use of their Bread Making Machine and cordially entertained many members.

WHITE LILY WASHER COMPANY, Toledo, Ohio: R. P. Searle, manager, and A. F. Hansen showed the workings of the White Lily Washing Machine, and gave out many puzzles and white lilies. Mr. Hansen occasionally amused callers with jokes and sleight of hand tricks.

SYRACUSE STOVE WORKS, Syracuse, N. Y.: Geo. N. Pickstock and A. E. Coe.

NATIONAL LEAD COMPANY: C. A. Parkhurst.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.: G. G. Stuart.

PHILLIPS & CLARK STOVE COMPANY, Geneva, N. Y.: H. R. Chambers and P. R. Woodstock. Souvenir pocket memorandum tablets and rulers were given away as souvenirs.

WIER STOVE COMPANY, Taunton, Mass.: W. H. Barker.

ROBESON CUTLERY COMPANY and ROCHESTER STAMPING COMPANY, Rochester, N. Y., had a large sample room together, which was most attractively fitted up and was in charge of F. J. Cross, C. V. Lewis and C. W. Silcox. They showed Nickel Plated Ware, Anti-Rust Tinware, Pocket Knives, Razors, Shears and Carvers. Knife blade openers were given as souvenirs.

AUTO-WASHINE COMPANY, Toledo, Ohio, exhibited an Auto-Washine to many callers.

BUFFALO WHOLESALE HARDWARE COMPANY, Buffalo, N. Y., E. J. Neale, who was much in evidence at the convention and was cordially greeted by many friends.

The trade press was represented by *The Iron Age*, New York, R. R. Williams and H. M. Williams, and *Hardware*, New York, A. E. Bolles.

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NEW ENGLAND HARDWARE DEALERS' ASSOCIATION.

THE NEW ENGLAND HARDWARE DEALERS' ASSOCIATION took important action at the adjourned annual meeting, held at the rooms of the Boston Merchants' Association, Boston, on the 9th inst. The by-laws were amended so that hereafter the membership will be confined exclusively to the retail dealers, the word "wholesale" being stricken out. A committee for reorganization made a report, and sounded the keynote for an awakening of interest in the association. A determined effort will be made to interest the retail Hardware dealers all over New England, and to take an aggressive position on the various questions which are at present interesting the various Hardware associations of the country, and any others that may come up from time to time. The belief was expressed by a number of members that the possibilities open to a New England Hardware Association are very great, for with the large membership that is possible the influence of such a body would be effectively felt. An Executive Committee, consisting of active and influential members, was appointed with power to take action toward accomplishing the desired ends.

Reorganization Committee Report.

President John H. Sayward of Haverhill, Mass., was in the chair. D. Fletcher Barber of Boston made the

JOHN H. SAYWARD, President.

report for the Committee for Reorganization, the other members of which were Henry M. Sanders and F. Alexander Chandler of Boston. After considerable discussion the report of the committee was accepted unanimously, including the change in by-laws by which membership in the association was restricted to the retailers. George F. Mulhall of Boston, representing the jobbers, voiced the sentiments of these gentlemen in expressing entire approval of the change which will take ten wholesalers from the list of members. Mr. Barber and others spoke of the friendly and energetic co-operation of the members from the jobbing trade, and regretted for many reasons the change which would exclude them. But it was explained that perhaps there would be greater freedom of discussion among the retailers in the meetings if only themselves were present. The jobbers of New England have an association of their own. In other States the retailers have associations restricted to their own branch of the trade. So, on the whole, it was deemed best to make the change.

The New England Association had 50 members with the jobbers. The change will reduce the membership to 40. With this as a nucleus it is planned to add new members as rapidly as possible in the hope that the New England Association, one of the oldest organizations of the kind, will reach proportions which will rank it with the most important Hardware associations in the country.

In the course of the discussion, in speaking about the influence of such an association, the custom of some of the Builders' Hardware manufacturers in entering into

JOHN B. HUNTER, First Vice-President.

competition with the retailers came up for vigorous condemnation. Other kindred topics were touched upon. The members appeared to realize more than ever before how great advantages may be obtained by organization on a large scale, which realization is founded to a considerable extent upon the results obtained by similar associations in various States.

The Connecticut Association was alluded to as pretty well covering that State, which might make it difficult to obtain members from among Connecticut dealers. It was suggested that an arrangement be made by which the membership in the New England Association of a

E. A. LOOMIS, Second Vice-President.

few of the members of the Connecticut Association would bring the entire association into membership in the New England association.

Officers Elected.

The Nominating Committee appointed at the annual meeting, consisting of W. D. Parlin of Natick, S. D. Balkam of Jamaica Plains and George F. Mulhall of Boston, made its report, which did not include the nomination of a president, that selection being left to the meeting as a

whole because it was a foregone conclusion that President Sayward would be re-elected if he could be persuaded to serve another year. He was elected from the floor, nominated by Mr. Barber and seconded by Charles E. Adams of Lowell, Mass. The list of officers as unanimously elected is as follows:

PRESIDENT, John H. Sayward, Haverhill, Mass.
FIRST VICE-PRESIDENT, John B. Hunter, J. B. Hunter Company, Boston.
SECOND VICE-PRESIDENT, E. A. Loomis, Belcher & Loomis Company, Providence, R. I.

JAS. A. FARLESS, Secretary.

SECRETARY, James A. Farless, Boston.
ASSISTANT SECRETARY, F. Alexander Chandler, Chandler & Farquhar Company, Boston.
TREASURER, Henry M. Sanders, Henry A. Sanders & Co., Boston.
DIRECTORS: The president (ex-officio) and D. Fletcher Barber, Chandler & Barber, Boston; Charles E. Adams, Lowell, Mass.; B. C. Pierce, Pierce Hardware Company, Taunton, Mass.; Calvin M. Nichols, Hoyt Company, Boston; Joseph H. Williams, Burditt & Williams Company, Boston.

Mr. Adams should be remembered not only as a prominent retail Hardware dealer, but also as the present

HENRY M. SANDERS, Treasurer.

president of the Massachusetts State Board of Trade, which is one of the largest and most aggressive in the United States.

Standard Hardware Company, Gastonia, N. C., have been organized with a capital stock of $20,000, to carry on the general Hardware business.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C., March 5, 1904.

The Week's Hardware Trade.

THE vagaries of our fearful and wonderful climate are again a hindrance to trade. A fortnight ago the weather was mild and enjoyable, and this reacted favorably upon the building industries. Suddenly, just when the trade was smiling at the prospect of spring, putting out samples of spring goods, and generally leaving winter things behind, the weather veered round in a single night, and we have had frost and snow and rain and cutting winds. The result is that trade continues in a distinctly unsatisfactory condition. The slight improvement in copper has brought a few orders for Rolled Metal Tubes and Wire, but there is still room for improvement. Copper Wire Drawers, however, are fairly busy. The cabinet brass trades continue to do an average trade, and Hinges, Rods and Door and Window Furniture are selling well. The indications are that these orders are for lower middle class dwellings, because purely ornamental or decorative goods are a drug in the market. In the Cycle industry expectations are not pitched high. On the other hand, we must remember that Easter comes after the turn of the quarter, and it is the Easter demands that are the surest indications as to the trend of the Cycle industry. There is an improving demand for Cut Nails, Screws, Bolts and Nuts. Pumping plant for irrigation is selling unusually well, and the enameled sign manufacturers continue busy. I have repeatedly drawn attention to the pressure there is in this particular line, and I am satisfied that a progressive American firm could capture some of it. In the Lock trade the best Locks are selling better than the poorer qualities. The Edge Tool makers continue in steady employment upon orders, chiefly from abroad, and Cultivating Implements are in improved request. The japanners are satisfied with themselves. From Sheffield I hear that there is some slight improvement in the Cutlery and Edge Tool industries. This may be due to a natural stimulation in the Sheffield trade, owing to the large orders for armor plate, amounting to 6000 tons, which have been placed there this week. It is but natural that tool makers should benefit indirectly when the heavier trades are busy. A short time ago London was ordering in large quantities. This week London orders have been exceedingly poor, whereas improved orders have come from Lancashire and Yorkshire. This no doubt is due to the revival of trade, which has naturally followed the break-up of the cotton corner.

On overseas account Canadian orders are coming in fairly well, as also orders from Nova Scotia, Newfoundland and British Columbia. From South Africa one continues to hear of straitened monetary conditions, particularly in the Transvaal, though there is a fair amount of business doing both in Natal and Cape Colony, more particularly in new works, warehouses, railway extensions, docks, wharves, &c. The railroad strike in Argentina has given a monetary check to trade conditions in that country, which had been on the upward trend for some months past. A noticeable improvement in orders and indents is noted from Australia and New Zealand. These orders are chiefly for Iron, Plain and Galvanized Fencing Wire, Pumping and Mining Machinery, Tools and Rolled Metal. The dispatch of goods to China, Japan and the Far East is, of course, adversely affected by the war.

Taking into account both home and foreign trade, and having regard to the general state of employment, I think it may be said that the past week shows a distinct improvement, but it does not amount to a great deal.

Proof-Marking of Foreign Gun Barrels.

An item of some interest is the decision of the Birmingham Proof House Guardians to increase the charges for stamping all descriptions of foreign made Gun Barrels. The schedule of differential fees has not yet been finally constructed, but the intention unmistakably is to give the home manufacturer a distinct preference over his foreign competitors.

FACTORY COST AND BUSINESS METHODS.

FACTORY AND OFFICE SYSTEM OF ATLAS MFG. COMPANY, NEW HAVEN.

The Inventory Methods of the Atlas Mfg Company, as described in their Scheme Book, are presented herewith, forming the final chapter of the interesting series on the systems employed by them.

Part XI.

INVENTORY.— Page 150.

The Inventory will be kept as a "Running" inventory, a card system and a loose leaf ledger being used for the purpose.

SEC. 1. The cards [34] are used for Manufacturing Material, Manufacturing Supplies, Goods in Process, Finished Parts, Goods Packed, Machine Room Material, Machine Room Supplies, Office Supplies and such other articles the stock on hand of which varies in quantity through the year. A separate card is used for each article. The quantity of each article is placed on the card and additions are noted as made, also all disbursements are noted as made, and the difference is always the stock on hand at any particular time.

SEC. 2. The Ledger [35] is used for Machinery, Shop Fixtures, Office Fixtures and such other property as is practically permanent, not varying in *quantity*, but subject to change in value either from depreciation or appreciation.

SEC. 3. The *Tools* and *Machinery Account* is subdivided in this Ledger as follows:

a. The *Machines* proper, together with their attachments, hand and bench fixtures, except Vises and other small appliances in the machine room. *Machines* are numbered from 1 to 999. *Attachments* are given the same number as the machines they are used on with a letter added, a, b or c, &c. A *machine* is considered to be any device which has mechanical motion, having for its object either to generate or transmute power or to modify material subjected to the force of such motion.

b. Auxiliary Machines.—These are considered to be any device which has mechanical motion the action of which does not have for an object either the generation or transmuting of power or the modifying of material, but rather is to facilitate the doing of work, as in the case of a Reel or Hand Truck, Block and Fall. A Clock, Scale, Counter or other register would fall in this class under the definition.

c. Sets of "Operation Tools."—These consist of all the Dies, Punches, Beds, Guides and other parts that are used together in the performance of any operation in the manufacturing department, and are numbered from 1000 up. The principal pieces in the set are to bear the number, as always the Punch and Die, upper and lower Beds, guides (manufacturing gauges), &c. Additional sets are marked "Duplicate," "Triplicate," &c.

d. Auxiliary Tools.—These include Vises, Clamps, Angle Plates, Taps and Drills larger than ½ inch, all standard Reamers, Counter Bores, Mills and Arbors, all small Tools that do not come under the head of machine room supplies; also Tools used in packing and other parts of the factory, Planer and Lathe Tools.

e. Special Auxiliary Tools.—These include special Mills, Taps, Counter Bores, Arbors, Jigs and special holders used in making and fitting Dies.

f. Templates, Die and Tool Gauges.

g. Inspectors' Gauges.—These consist of the standards used to gauge the goods by when in process of manufacture.

h. Patterns and Drawings.

i. Belts.

j. Shafts.—Each Shaft is considered to be made up of the shafting itself, the Hangers, Pulleys, Collars, Couplings, Bolts, Washers, Shifters, &c. All the Shafts, excepting those Counter Shafts, which are regularly furnished with particular machines, are numbered; the *main* Shafts, Jacks, Mules and Idlers are numbered from 1 to 20; Counters on the first floor from No. 100 to 200; Counters on the second floor from No. 200 to 300. The numbering commences at the north and east ends of the rooms, giving the even numbers on the right of the main Shaft and the odd numbers on the left of the main Shaft. If additional Shafts are put up after the numbering is completed the new Shaft takes the number of the Shaft it follows, with the letter A, B or C added.

k. Drawing Utensils.

l. Unfinished Work in the Machine Room.

N. B.—Beds and Holders are inventoried as attachments as per Page 130, Sec. 13, or as parts of "Tool Sets," as Page 130, Sec. 13B.

SEC. 4. *Shop Fixtures* is divided as follows: With the exception of Miscellaneous Fixtures, each division includes simply those fixtures in the several rooms that are peculiar to the work done in that room. It is not essential that the fixtures in each case should be located in the room.

a. Machine Room Fixtures.—Include Forges, Tanks, Anvils, Movable Racks, Stands, Cases, &c.

b. Tool Room Fixtures.—Include Movable Racks, Stands, Cases, Steel Tool and Die Boxes, &c.

c. Japan Room Fixtures.—Include Ovens, Tanks, Racks, &c.

d. Tinning Room Fixtures.—Include Furnaces, Crocks, Movable Stands, &c.

e. General Manufacturing Fixtures.—Include Trays, Oily Waste Cans and other Receptacles, Movable Stands, &c. (Aprons and Pans fitted especially to particular machines are considered as attachments to those machines.)

f. Miscellaneous Fixtures.—Include the following items wherever found through the building: All Stationary Racks, Benches, Partitions, Shelving, &c., Steam Pipes, Radiators, &c., Water Pipes, Closets, &c., Gas Pipes, Fixtures, &c., Electric Lights and Wiring, &c., Electric Bells, Battery, Wiring, &c., and such other articles as do not fall under any of the above heads.

4 x 5 Braces.

1 ON HAND		2 RECEIVED		3 DELIVERED TO MF'G DEPT.		VALUE PER 4 TOTAL REC'D Nos. 1 and 2		5 TOTAL DISPENSED OR TOTAL OF No. 3		CARD NO. 6 BALANCE ON HAND		VALUE OF BALANCE
DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	
1/12	14,329	1/15	5,000	1/24	5,000	1/26	34,899	1/26	10,000	1/26	24,899	
		1/16	5,000	1/25	5000							
		1/19	4,970									
		1/25	5,600									
1/26	24,899											

Fig. 42.—Front of Card in Card Inventory.

[34] The cards used for this purpose, measuring 5 x 8 inches, are kept in a regular card index file. The front of one of these cards, filled out to show the inventory of 4 x 5 braces, is reproduced in Fig. 42. The back of another card, the front of which in this case has been filled out for paper boxes No. 1, is shown in Fig. 43. The memoranda on the back of these cards are filled out from the carbon copies of orders that are retained in the office. These carbon copies are then marked with a small cross, indicating that this has been done.

[35] A page in this Inventory Ledger was illustrated in Fig. 41 and described in Part X, published last week.

METHOD OF OPERATING THE RUNNING INVENTORY CARDS.—Page 151.

SEC. 1. All material coming on to the premises is reported to the office on the slips provided for the purpose, in accordance with instructions given to receiving clerks. (See Page 65 and Page 40, Sec. 5.)

SEC. 2. All disbursements of material and parts to the several departments are noted on slips issued by the office to the stock rooms. (See Page 65, Sec. 4.)

SEC. 3. The goods produced in the factory are sent either to the store room or to the finishing rooms, and thence to the packing, and finally to the stock room.

SEC. 4. When they are delivered to the store room they are accompanied by a slip, or memorandum, which is checked by the person in charge and handed to the office. The entry on the inventory is taken from these slips.

SEC. 5. When goods are delivered to the finishing room they are not counted until they are packed and put in stock room, when a memorandum is sent to the office of the quantity thus put in stock for the "daily record." (See Page 61, Sec. 4.) The entries for the inventory are taken from this daily record at convenient intervals.

SEC. 6. The disbursements of finished goods are taken monthly from the sales book.

DIES AND KINDRED ARTICLES. Page 152.

SEC. 1. A page on the ledger is given to each machine, "set of operating tools" or group of material, and the original cost or value is placed on the sheet.

SEC. 2. These pages are ruled,[36] providing a column for items increasing the value of the article (appreciation), a column for considerations which decrease the value (depreciation), a column each for total appreciation and total depreciation, a column for "present worth" and "inventory value." Through balancing the items of appreciation and depreciation an approximate "inventory value" is secured.

ORDERED IN					WANTED					
DATE	OUR ORDER NUMBER	FROM WHOM	QUANTITY	TO BE DELIVERED	DATE	OUR REQUISITION NUMBER	FOR WHOM	QUANTITY	TO BE DELIVERED	
2/11/04	1432	White, Black & Co.	15000	3/29						
3/14/04	1467	Sherman Co.	10,000	4/2						

Fig. 43.—Back of Card in Card Inventory.

RECORDS.—Page 160.

Of the several records kept independent of any regular department are the following:

SEC. 1. A daily record[37] of the output of such articles and operations as is of special interest because of its influence on the rest of the work. This record has value also as a means of checking up the correctness of the weekly pay ticket. The quantities on each should tally. The "run" number should be shown upon which the record applies—that is, the record should be kept as applying on a certain "run" or manufacturing order.

SEC. 2. A record of the help regarding points of special interest, such as habits or promptness, amount of scrap charged against each, and especially as to those who habitually fail to earn the minimum wage paid. This class should be gotten rid of.

SEC. 3. A record of the highest rates of production of the several operations should be kept.

SEC. 4. The weekly pay tickets are, of course, a record, also the "Run Cards" made up from these pay tickets, and the memorandum placed on the completed "Order to Manufacture." (See Page 51, Sec. 7.) These "Run Cards" and Orders to Manufacture should tally with each other as to the amount of material furnished, the quantity of perfect work produced and the amount of scrap made, and the aggregate of the production of each run as reported in the "Daily Record" should also correspond with the quantity done, as shown on the "Run Cards" and Orders to Manufacture.

SEC. 5. The other items of information are used as their nature suggests, either in the costs department or in tabulating the results in any other department. Such summaries as may be thought useful in individual cases should be made and their suggestions followed.

CONTRACTS AND AGREEMENTS.—Page 170.

STATEMENTS AND REPORTS.—Page 180.

The above pages have not as yet been filled out.

THE END.

[36] See Fig. 41 in last week's issue.

[37] This was described under Page 54 in Part V.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers issuing new catalogues or price-lists are requested to send to THE IRON AGE *two copies—one for the Catalogue Department in the New York Office and one for the Iron Age Library of Trade Literature in London.*

CUTAWAY HARROW COMPANY, Higganum, Conn.: Illustrated price-lists relating to Bog and Bush Killers, Harrows, Grass Hoes, Weeders, Plows, Seed Drills and Seeders, Cultivators, Root Cutters, Tool Grinders and Whetstones, Wagon Jacks, &c.

N. T. THAYER & Co., 119 Beach street, Boston, Mass.: Catalogue devoted to Cut Soles, Taps, Sole Leather, Spiral and Tin Tubular Laces, &c.

UNITED ELECTRIC HEATING COMPANY, Detroit, Mich.: Illustrated circulars relating to Electric Heating Devices, including Chafing Dishes, Sad Irons, Soldering Irons, Glue Pots, Tea and Coffee Pots, Ovens, Cooking Utensils, &c.

EUGENE E. NICE, 272-274 South Second street, Philadelphia, Pa.: Catalogue A of Varnishes and Paints. These include Varnishes and Japans, Colors in Oil, Distemper Colors, Colors in Japan, White Lead and Zinc, Putty, Paints Ground in Oil, Fillers, Mixed Paints, Enamels, Stains, Bronze Paints, Floor Preparations, Furniture Polish, Paint and Varnish Remover, Dry Paints, &c.

THE STEEL SET DIAMOND COMPANY, 36 Gold street, New York: Catalogue relating to Diamond Tools of all kinds, Wire Dies, Draw Plates, Boring Crowns for Diamond Drills, Diamond Saws, Diamond Turning Tools, Diamond Points, Diamond Saw Teeth, Diamond Drills, Diamonds Set in Cast Steel, &c.

B. B. NOYES & Co., Greenfield, Mass., Wells Bros. Company, Greenfield, Mass., sales agents: Catalogue illustrating Little Giant Cut Gear Drilling Machines in a variety of styles, Blacksmiths' Drills, Drilling Machine Vise, Drilling Machines, Bolt Headers, Foot Vise and Bolt Header, Swage Blocks, Mandrels, Axle Setter and Straightener, Iron Plates for Tire Setting, &c.

EYELET TOOL COMPANY, 40 Lincoln street, Boston, Mass.: Illustrated catalogue devoted to Spring, Bench and Tool Power Eyelet Sets and Leather Punches, Drive or Belt Punches, Burr and Rivet Sets, Button Hole Cutters, Sets and Punch Tubes of all kinds made to order, &c.

LA CROSSE STEEL ROOFING & CORRUGATING COMPANY, La Crosse, Wis.: Catalogue and price-list relating to Eaves Trough, Conductor Pipe, Pipe Hangers, Hooks, Cut Offs, Ridge Capping, Cornices, Window Caps, Steel Roofing, Corrugated Iron, Steel Brick, Rock Face Stone, Metallic Shingles, Shutters, Embossed Steel Ceilings, &c.

PARKER WIRE GOODS COMPANY, Worcester, Mass.: New pages, showing Wrought Hammock Hooks, for insertion in their catalogue.

The National Convention.

THE delegates representing the different State Retail Hardware associations which make up the National Retail Hardware Dealers' Association will assemble for their annual convention on the 22d, 23d and 24th inst., at Indianapolis, the Claypool Hotel being headquarters. A full representation of the various State organizations affiliated with the National is expected in view of the importance of the subjects which will come up for discussion and action. It will probably prove to be the most interesting and fruitful convention yet held by the National body. As usual the sessions will be of an executive character.

SAMUEL WINSLOW SKATE MFG. COMPANY.

THE business of the Samuel Winslow Skate Mfg. Company of Worcester, Mass., has been refinanced, and $175,000 of new money had been put into it. The recent receivership was purely technical, having resulted from outside complications, and the business has been conducted by the old officers without interruption just as if no receivership had existed, though under the formal direction of the receivers. The receivers have ended their duties, having been discharged by the Court March 5. The refinancing carried with it additions to the Board of Directors, which is now made up as follows: A. George Bullock, Francis H. Dewey, Otis W. Everett, Homer Gage, James Logan, Philip W. Moen and Col. Samuel E. Winslow. The officers are: President and treasurer, Samuel E. Winslow; vice-president, Philip W. Moen; secretary, Otis W. Everett, and auditor, A. H. Stone. All these parties are Worcester men. Colonel Bullock is president of the State Mutual Life Assurance Company, Mr. Dewey is president of the Worcester Consolidated Street Railway Company and the Mechanics' National Bank, as well as having other large financial interests, James Logan is the executive head of the United States Envelope Company, Mr. Moen was until recently a vice-president of the American Steel & Wire Company and Homer Gage is a director of the Crompton & Knowles Loom Works. Mr. Everett has been secretary and superintendent of the Winslow Company for a long time.

PENNSYLVANIA WHOLESALE HARDWARE AND SUPPLY ASSOCIATION.

THE members of the Pennsylvania Wholesale Hardware & Supply Association are holding their annual meeting to-day (Wednesday) at the Hotel Savoy, New York City. The morning and afternoon are being devoted to the regular business of the organization, and in the evening a dinner will be enjoyed.

ARCADE MFG. COMPANY.

ARCADE MFG. COMPANY, Freeport, Ill., have just issued their 1904 catalogue, which comprises more than 200 pages. The catalogue effectively presents the large and varied line of Coffee Mills, light Hardware specialties, Household Novelties, Wood and Iron Toys, &c., of which they are manufacturers. Among the more important additions to their products are the Modern Molding Machine, Clipper Cork Puller and X-Ray Lemon Squeezer.

HARTMANN, HAY & REIS, Belleville, Ill., inform us that through satisfactory settlement with their workmen operations in their Cut Nail mill, which has been shut down for the past three months on account of labor troubles, will be resumed in all departments by March 21, and that they will then be ready to fill orders with their usual promptness.

E. H. OULD HARDWARE COMPANY are embarking in the wholesale business at Norton, Va., handling Hardware, Tinware, Stoves, Mill and Mining Supplies, Wagons, Farming Implements, Paints, &c. The firm have a large and commodious and conveniently located building, erected especially for their purposes.

WEED & CO.'S NEW CATALOGUE.

WEED & CO., Buffalo, N. Y., have just issued a fine new illustrated descriptive catalogue of jobbing and supply goods in general and heavy Hardware, Bar Iron, Steel and Sheet Metals, Railroad, Contractors' and Mill Supplies, Pipe and Fittings, Tools, Cutlery and kindred goods. It is substantially bound in leather, and contains 1267 pages, 11 x 8½ inches. This business was established in 1818 and incorporated in 1903. A reproduction of their advertisement, 2¾ x 4¼ inches, dated September 23, 1818, and shown on one of the inside covers, the firm name then being G. & T. Weed, will be regarded with interest. The volume shows care and skill in its compilation, and indicates the growth and enterprise of the popular house which issues it.

UNDERHILL, CLINCH & CO.

UNDERHILL, CLINCH & CO., 94-96 Chambers street, New York, are distributing an Agricultural and Shovel list showing in compact form the kinds, numbers and important features of this class of goods carried in stock by them, with list prices and a blank column for discounts. Lawn Mowers, hand and power; Trowels, Hoes, Rakes, Scythes, Shears, Grass Hooks, Axes, Shovels, Spades, Scoops, Picks and kindred goods are also represented in compact and convenient form. Announcement is made that complete catalogues of the following manufacturers, for whom they are agents, will be sent on application: Oliver Ames & Sons Corporation, G. W. Bradley's Sons, Coldwell Lawn Mower Company and Geneva Tool Company.

TRADE ITEMS.

THE BRONSON-WALTON COMPANY, Cleveland, are presenting customers who handle their Bull Dog Wire Rope Clamp with a handsome souvenir paper-weight. The base plate carries a full-grown bull dog clamp. The souvenir is nickeled and is felt-protected beneath.

HEYMANN SUCESORES, Mazatlan, Mexico, importers of Hardware, Agricultural Implements, Machinery, Vehicles, Photographic Supplies, &c., issue an illustrated weekly calendar showing many goods of American manufacture, with illustrations of their extensive establishment.

A LARGE AUDIENCE very much enjoyed a performance given by the Gem Minstrels in Crosby's Hall, Brooklyn, on the evening of the 26th ult. The members of this organization, 25 in number, are all connected with the New York house of Sargent & Co., the title, doubtless, having been suggested by the well-known Food Chopper, and their maiden effort as a minstrel aggregation was exceedingly creditable. The entertainment was followed by dancing.

C. E. JENNINGS & Co., 101 Reade street, New York, manufacturers of large lines of Mechanics' Fine Tools, will between April 15 and May 1 remove their New York headquarters to much more commodious premises. They have leased the street floor, basement and cellar at 42 Murray street, near Church street, each 25 x 80 feet, now being thoroughly renovated. The rear is admirably ventilated and lighted, making all the floor much better adapted to their purposes than where they now are.

OLIVER P. MALONE of the Russell & Erwin Mfg. Company, New York, in charge of their export department, is now in Porto Rico in the interest of the company, going thence to Cuba, and from there to Mexico, *en route* to the United States, the entire trip occupying two or three months.

MISCELLANEOUS NOTES.

Spice Cabinet and Salt Boxes.

Tucker & Dorsey Mfg. Company, Indianapolis, Ind., for whom John H. Graham & Co., 113 Chambers street, New York, are selling agents, in a catalogue recently issued illustrate a spice cabinet and two styles of salt

boxes. The spice cabinet has eight drawers and is 10 inches wide by 12 inches high, so made as to hang against a wall or stand on a shelf. It is made of wood and varnished, also in a weathered oak finish at a slightly advanced price. The salt boxes, both made to hang or stand with top covers, are No. 1 varnished oak with corner posts and No. 2 of white wood, plain finish. The cabinets are six in a crate and the salt boxes 12 in a crate.

Reversible Connectors, B. & S. Pliers and Glass Rollers.

Smith & Hemenway Company, 296 Broadway, New York, are making a line of double handled or reversible clamps or connectors for electric wire linemen principally, although equally serviceable for any one having steel, copper or other wires to join, whether for inside or outside work. They have also added a slip joint, B. & S. pattern plier, which is a combination tool usable as gas plier, flat nose plier, cutting plier (by instantly slipping one of the two parts into a second pivot hole), screw driver and reamer, the two latter being on the handle ends. This plier can be furnished in full polished, half polished and nickel plated finishes, the length over all being 6½ inches. Another tool is a glass roller for truing heavy plate glass and light sheet glass. It is made in 12-inch heavy and 12-inch light styles, full polished finish only.

Boss Bread and Meat Slicer.

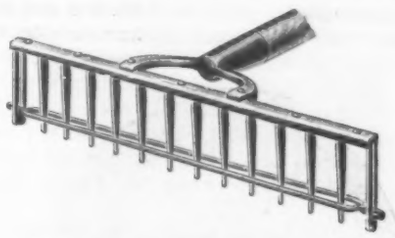
Tucker & Dorsey Mfg. Company, Indianapolis, Ind., for whom John H. Graham & Co., 113 Chambers street, New York, are selling agents, have just begun the manufacture of the Boss bread and meat slicer, here pictured. Its outer dimensions are 14 x 18 inches, its cutting space being 5¼ x 6 inches. In action as the knife is drawn down it cuts with a steady pull or draw movement as is customery when cutting bread or meat with a knife by hand. In combination with this movement is the circular edge of the finely tempered knife which increases the efficiency of the shear and imparts to the knife a double draw movement. The cast iron parts are nickeled and the top or wood frame is of oak, filled, varnished and

Boss Bread and Meat Slicer.

polished. The slicer is packed one in a box, and for the information of domestic and export shippers, it may be said, they weigh 180 pounds, and measure 14 cubic feet to the dozen.

Steel Anti-Clog Lawn Rake.

The Cronk & Carrier Mfg. Company, Elmira, N. Y., are making the Steel Anti-Clog Lawn Rake here illustrated. As shown, it is self cleaning or anti-clogging, the

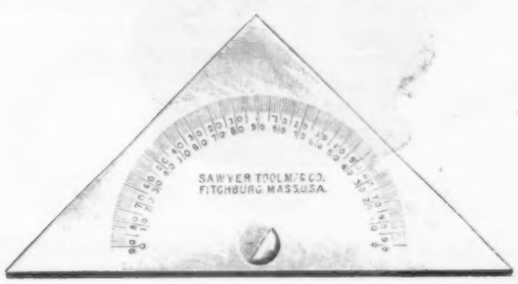


Steel Anti-Clog Lawn Rake.

wire cleaning bar preventing the cut grass from going above it. It also can be used as a garden rake by merely removing the cleaning bar. It is made entirely of steel, and has 14 teeth.

Angle Indicator.

The Angle Indicator shown in the accompanying illustration is designed to be used in connection with any rule, bevel or a universal bevel. It is furnished either with the half button shown in the cut, or with a bevel protrac-

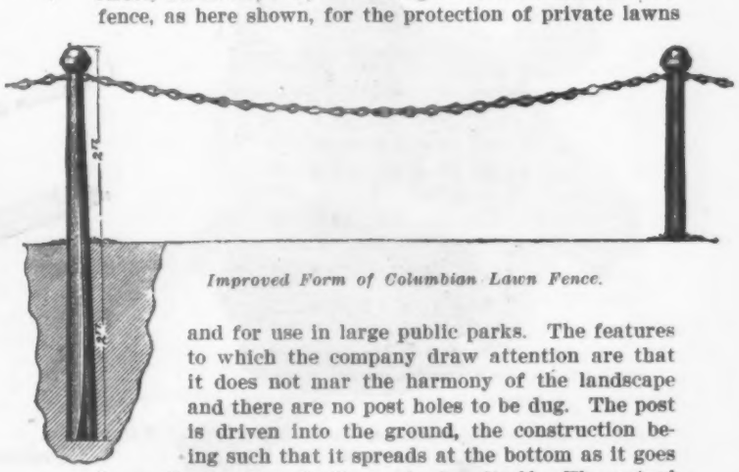


Angle Indicator.

tor, both serving the same purpose. The form of a right angle triangle is used, to give the machinist or draughtsman the often-used angles of 45 and 90 degrees. By use of this tool any angle within its scope may be quickly and accurately transferred. It is manufactured by the Sawyer Tool Mfg. Company, Fitchburg, Mass.

Columbian Lawn Fence.

The International Steel Post Company, 719 Chestnut street, St. Louis, Mo., have designed the Columbian lawn fence, as here shown, for the protection of private lawns



Improved Form of Columbian Lawn Fence.

and for use in large public parks. The features to which the company draw attention are that it does not mar the harmony of the landscape and there are no post holes to be dug. The post is driven into the ground, the construction being such that it spreads at the bottom as it goes down, thus automatically anchoring itself. The actual time of driving each post is said to be about 25 seconds. A contract has just been signed with the officials of the Louisiana Purchase Exposition, St. Louis, which is expected to require at least 50,000 feet for fencing grass plots, flower beds, &c. Space has also been allotted to the company for an exhibit in the Hardware Department of the Manufacturers' Building.

Britelite Acetylene House Lamp.

The Britelite Lamp Company, 45 Broadway, New York, have just put on the market the Britelite acetylene lamp, here illustrated. Fig. 1 shows the lamp complete with tripod and shade. This lamp burns a gas generated by dropping finely granulated calcium carbide from the

Fig. 1.—Britelite Acetylene House Lamp.

upper chamber directly under the burner into the water reservoir at the bottom, the supply of gas being controlled by a valve operated by the round thumb screw provided, in the same manner that an ordinary wick in an oil lamp is raised or lowered. In operation the granular "Electrolite" carbide is poured into the carbide chamber, as indicated in Fig. 3, by inverting that portion of the lamp; then, with the water receptacle charged, the two parts are joined, as seen in Fig. 2, and locked by a turn of the T-head thumb screw, which securely locks the two sections together at three equidistant points. The lamp

Fig. 2.—Showing Separation of Carbide Chamber and Water Reservoir.

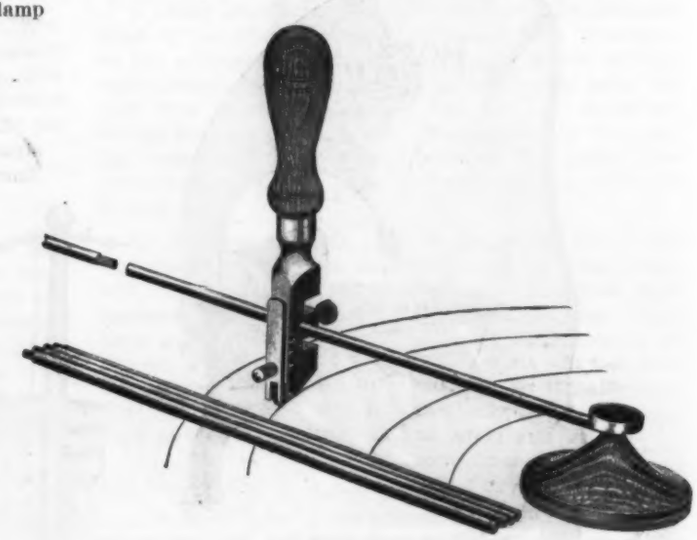
can be lighted and extinguished as easily and quickly as an ordinary lamp, without odor, as a turn of the round thumb screw cuts off the supply of carbide and therefore the supply of gas, except the small amount in process of generation, which is consumed at the burner until absolutely used up. The carbide chamber has a capacity of 1½ pounds of granulated carbide, which can be obtained in quantities at numerous depots as well as from various retailers throughout the country. A charge of 1½ pounds of carbide will give ten hours' burning, whether continuous or intermittent, the construction being such that the carbide is held in an air tight chamber without deterioration. The ½-foot burners give a 35 candle-power flame. The lamp can be furnished to take either 10 or 12 inch dome shades. The lamp is made of metal in Egyptian (black) or Nubian (brown) finishes.

Fig. 3.—Carbide Chamber Inverted for Charging.

Among the advantages of this lamp to which the company refer are a steady white light of high illuminating power, small amount of heat generated, absence of odor and ease with which it can be operated.

Interchangeable Circle Cutters.

Fletcher, Terry & Co., Forestville, Conn., are placing on the market a glass circle cutter, as here shown. It has a hardwood handle and base, the latter being covered on the bottom with 1-16-inch rubber to prevent slipping on the glass. The thumb piece has no sharp edges to hurt the thumb when holding the base in position. Especial attention is drawn to the extension rods, by the use of which any size circle can be cut, which the manufac-



Interchangeable Circle Cutters.

turers refer to as a great convenience in contrast with the usual sweeps, as there is no large rod to hinder when cutting a small circle. One prominent feature is the interchangeable head, which insures long service, as new cutters can be readily inserted by unloosening a small thumb screw when the old ones become worn and dull. With each tool 12 extra cutters are furnished. This firm also make a full line of interchangeable and common glass cutters, sweeps, &c.

Ball Bearing Sash Pulley.

The Grand Rapids Hardware Company, Grand Rapids, Mich., are placing on the market an entirely new type of sash pulley with ball bearing wheel, as shown in the sectional view, Fig. 2. As will be seen, it runs on a turned steel cone-axle, which is said to be a departure in the design of sash pulley wheels. Seven 3-16-inch steel balls travel between the groove of this axle and the polished steel bushing. The sash cord or chain rests in a polished

Fig. 1.—Grand Rapids Ball Bearing Sash Pulley.

steel groove, a flat groove for chain and a round groove for cord, the wheels being furnished either flat or round as required. The wheel itself is made from two sections of pressed steel. These sections are held together by four eyelets, two on either side. The Grand Rapids pulley is inserted into the frame work of the window without nails or screws. It is only necessary for the carpenter to bore four holes. In the type illustrated a mortise can be made in one of three ways, either by boring four 13-16-inch holes in line, with centers ½ inch apart, or, by use of the

Fig. 2.—Sectional View of Wheel.

quadruple bit, boring the four holes at once, or by making a straight side mortise with round ends, 13-16 inch wide by 2 11-16 inches long. It is not necessary to counterbore for face plate, and no cutting or trimming is necessary. The same company manufacture the Fox steel sash pulleys, as well as a line of Grand Rapids pulleys, having roller bearings instead of ball bearings.

Armory Gas Smelting Furnace.

The Ideal Mfg. Company, New Haven, Conn., have put on the market the Ideal gas smelting furnace, cast iron ring and ladle here illustrated. It is designed for use in armories in connection with the Ideal armory mold, also made by them, for casting regular or special bullets. In size it is 9 x 9 x 11 inches, weighs 41 pounds and has a capacity of 50 to 75 pounds of metal. The furnace may be located permanently and connected with fixed pipes, or placed temporarily wherever wanted and supplied with gas through a rubber tube. In use in their own factory, they find that with 50 pounds of metal and furnace in a cold state they can melt the metal in 25 or 30 minutes from time gas is lighted, with a consumption of 10 cubic feet of gas. After metal is at proper heat one-half the

Fig. 1.—Armory Gas Smelting Furnace.

flow of gas can be shut off. The best results are obtained when the metal is heated by covering the surface with fine charcoal, which gets red hot on under side and keeps the metal hot, at the same time keeping the air from cooling the surface and oxidizing the metal.

Fig. 2.—Cast Iron Ring.

Fig. 3.—Ladle or Dipper.

A cast iron ring, Fig. 2, with 4-inch hole will keep the charcoal outside of it and provide a clean 4-inch well hole from which to dip out the molten metal, Fig. 3 showing the ladle with which to dip it.

Steel Clamps.

The steel clamp shown in the accompanying illustration and made by the Sawyer Tool Mfg. Company, Fitchburg, Mass., has as a feature the reinforcement of the jaws where the outer screws penetrate them, which does

Steel Clamp.

away with the tendency of this form of clamp to break when the usual great strain is put upon them. The screws have a ball and socket bearing upon the jaws, for the purpose of eliminating unnecessary strain upon the threads.

Semi-Steel Solid Bar Vise.

The swivel vise shown in the accompanying illustrations has its slide reinforced by the introduction of a steel bar, B, indicated by the dotted lines in Fig. 2, the

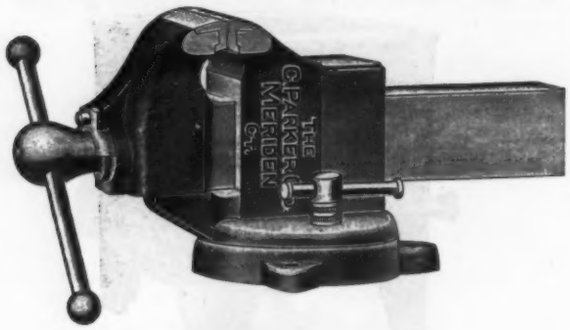


Fig. 1.—Semi-Steel Solid Bar Vise.

bar, ⅝ to ¾ inch square, varying with the size of the vise. The metal of the slide itself is poured around the steel bar in the mold when the slide is cast. The front jaw is made very heavy at A, and the jaws are lowered to reduce the leverage when a strain is put upon them.

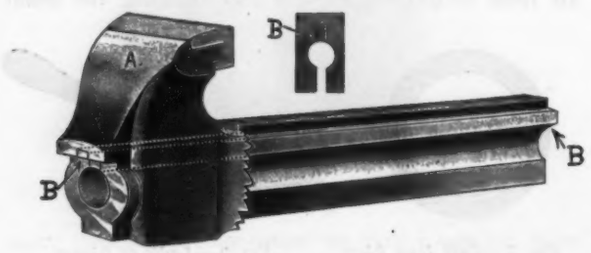


Fig. 2.—View of Reinforced Slide.

The vise is made in both swivel and stationary styles, in six sizes, ranging in weight from 35 to 185 pounds with swivel and from 30 to 148 pounds in the stationary pattern. The vises are made by the Charles Parker Company, Meriden, Conn., and 32 Warren street, New York.

Machine Screw Counterbores.

Kendrick & Davis, Lebanon, N. H., are putting on the market machine screw counterbores, some of which are here illustrated, for both filister and flat heads. The manufacturers state that the difficulty heretofore in producing this kind of tool has been to make it accurate at a moderate price, which has now been accomplished by the construction of a special machine, which produces a counterbore at one setting direct from the rod, turning, forming, fluting and relieving at practically one operation by the Jenkins patented process. The manufac-

Counterbores for Filister and Flat Head Machine Screws.

turers are now making a line which includes such sizes as are made for watch factories, ranging in size up to nearly ½ inch. The smaller sizes are made from wire 0.040 in diameter, having six teeth, and 0.017 leader, which, when finished, requires more than 3000 to weigh 1 pound. At the same time they are accurately proportioned one to another. The larger sizes from ⅛ to 7-16 inch, as well as the machine screw sizes, have given the most satisfactory results, we are assured. The success of this line of tools is attributed entirely to the original method of relieving. By the process employed an unlimited variety of patterns can be produced in addition to the regular line, for the manufacture of such goods as watches, clocks, optical goods, typewriters, firearms, &c., inquiries for which are solicited. The tools are equally suitable for working in hard rubber, fiber and similar materials, as well as metals. They are sold in solid sizes or put up in sets of 12 assorted, in solid wood boxes, bored to hold the drills upright.

Sturges Improved Pasteurizer.

We illustrate herewith a new type of Pasteurizer, consisting of but three tubs, the uppermost of which is the heater, below it the first cooler and then the second cooler. The successful Pasteurizing or sterilizing of milk is dependent upon raising the temperature to about 170 or 175 degrees, and cooling it down to 45 or 50 degrees in the shortest possible space of time. One difficulty ordinarily attending this process is that of avoiding the "cooking-on" of milk to the sides of the heating vessels. In order to secure the necessary high temperature in a short space of time without cooking it is necessary that the milk be rapidly agitated, but without sufficient violence to break the milk globules. This desideratum has

Sturges Improved Pasteurizer.

been accomplished, the manufacturers believe, in the Sturges Pasteurizer. In this apparatus the milk or cream is introduced in a thin column or wall between outer and inner cylinders, the cylinders revolving in opposite directions at a speed of about 20 revolutions per minute. The fact that the cylinders themselves revolve and that their walls are smooth instead of being corrugated is stated by the manufacturers to eliminate successfully the difficulty of milk cooking on the sides, something that has not thus far been accomplished, it is said, where the milk is agitated within stationary walls. The cylinders are made of heavy copper, and tinned wherever milk comes in contact with the surface. They are removable for cleansing, and can be replaced without loss of time and without altering any adjustments. These cylinders rest in tubs made of cypress, and the only bearing is a hardened steel point at the bottom of the cylinder, and as this is submerged it cannot heat. Milk is heated to from 170 to 175 degrees F. in the upper tank shown in the illustration. From that it passes to the first cooler, in which its temperature is reduced by means of water on both sides of the moving cylinders to about 80 degrees, and in the second cooler the temperature is reduced by ice or water by the same method to about 45 or 50 degrees, as desired. This Pasteurizer is manufactured by Sturges & Burn Mfg. Company, Chicago.

Current Hardware Prices.

REVISED MARCH 15, 1904

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued June, 1903, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Abrasives—

Adamite in Carloads:
Crystal ₩ ton $90@100
Grain ₩ ton $120@140
See also *Emery*.

Adjusters, Blind—

Domestic, ₩ doz. $3.00 33⅓%
North's 10%
Zimmerman's—See *Fasteners, Blind*.

Window Stop—

Ives' Patent 35%
Tapin's Perfection 35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Arm and Hammer, Wrought ₩ lb 8½@8¾c
Buel Patent Trenton ₩ lb 9½@9¾c
Eagle Anvils ₩ lb 7¼@7¾c
Hay-Budden, Wrought 9@9¼c
Horseshoe brand, Wrought 9@9¼c

Imported—

Peter Wright & Sons ₩ lb 10½c

Anvil, Vise and Drill—

Millers Falls Co., $18.00 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co. 30&5%

Augers and Bits—

Com. Double Spur 70&10@75%
Borwag Machine Augers 66⅔@70%
Car Bits, 12-in. twist 60@60&10%
Jennings' Pattern 50&10&5@60%
Ford's Auger and Car Bits 40&5%
Forstner Pat. Auger Bits 35%
C. E. Jennings & Co.:
No. 10 ext. lip, & Jennings' list 25&10%
No. 30, R. Jennings' List 40&7½&10%
Russell Jennings' 25&10&2½%
L'Hommedieu Car Bits 15&10%
Mayher's Countersink Bits 45%
Millers' " 50&10&7½%
Pugh's " 20%
Pugh & Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 50&10%
Snell's Car Bits, 12-in. twist 60%
Wright's Jennings Bits (R. Jennings' list) 50%

Bit Stock Drills—

See *Drills, Twist*.

Expansive Bits—

Clark's small, $15; large, $26 50&10%
Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18 50&10%
Ford's, Clark's Pattern 50&10@60%
C. E. Jennings & Co., Steer's Pat. 25&10%
Swan's 60%

Gimlet Bits—

Common Double Cut. gro. $3.00@3.25
German Pattern gro. $4.50@4.75

Hollow Augers—

Bonney Pattern, per doz. $10.00@11.00
Ames 35&10%
New Patent 35&10%
Universal 30%
Wood's Universal 25%

Ship Augers and Bits—

Ford's 40%
Snell's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15&10%
Watrous' 33⅓&10%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled gro. $2.75@3.00
Unhandled, Shouldered gro. 63@66c
Unhandled, Patent gro. 66@70c
Peg Awls:
Unhandled, Patent gro. 31@34c
Unhandled, Shouldered gro. 65@70c
Scratch Awls:
Handled, Common gro. $3.50@4.00
Handled, Socket gro. $11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality $5.50@6.00
Second Quality $4.75@5.25

Axle Grease—See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar 5@5½c
Concord, Solid Collar 5@5½c
No. 1 Common 4@4½c
No. 1½ Com. New Style 4½@5c
No. 2 Solid Collar 4¼@5¼c
Nos. 7, 8, 11 and 12 60&5@60&10%
Nos. 13 to 14 60@5@60&10%
Nos. 15 to 18 60&10@70%
Nos. 19 to 22 60&10@70%

Boxes, Axle—

Common and Concord, not turned 15, 4¼@4½c
Common and Concord, turned lb. 5@5¼c
Half Patent lb. 9@9½c

Bait— Fishing—

Hendryx:
A Bait 30%
B Bait 25%
Competitor Bait 20&5%

Balances— Sash—

Caldwell new list 50%
Pullman's 60%

Spring—

Spring Balances 60@60&5%
Chatillon's:
Light Spg. Balances 40&10%
Straight Balances 40%
Circular Balances 50%
Large Dial 30%
Pelouze 50%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb., per lb. 3@3½c

Towel—

No. 10 Ideal, Nickel Plate ₩ gro, $8.50

Beams, Scale—

Scale Beams, List Jan. 12, '82 40&10%
Chatillon's No. 1 30%
Chatillon's No. 2 40%

Beaters— Egg—

Lightning Chain, ₩ gro $15.00
National Mfg. Co.: ₩ gro.
No. 1 Dover, Family size $7.00
No. 2 Dover, Hotel size 14.00
Taplin Mfg. Co.: ₩ gro.
No. 69 Improved Dover 6.00
No. 75 Improved Dover 6.50
No. 100 Improved Dover 7.00
No. 102 Improved Dover, Tin'd 8.50
No. 150 Improved Dover, Hotel 15.00
No. 152 Imp'd Dover, Hotel, T'd 17.00
No. 200 Imp'd Dover Tumbler 8.50
No. 202 Imp'd Dover Tumbler, Tin'd 9.50
No. 300, Imp'd Dover Mammoth, ₩ doz 25.00
Western, W. G. Co., Buffalo 8.00
Wonder (S. S. & Co.) ₩ gro. net, 6.00

Bellows—

Blacksmith, Standard List 75@75&5%

Blacksmiths'—

Inch	30	32	34	36	38	40
Each	$3.50	3.75	4.25	4.80	5.35	6.15

Extra Length:

Each	$4.00	4.55	5.10	5.80	6.40	7.50

Molders—

Inch	10	12	14
Doz	$8.50	10.00	13.00

Hand—

Inch	6	7	8	9	10
Doz	$4.25	4.50	5.00	6.50	7.75

Net Prices.

Bells— Cow—

Ordinary goods 75&5@75&10%
High grade 70&10@70&10&5%
Jersey 75&10%
Texas Star 50%

Door—

Abbe's Gong 45%
Barton Gong 55%
Home, R. & E. Mfg. Co.'s 55&10%
Lever and Pull, Sargent's 60&10&10%
Yankee Gong 55%

Hand—

Hand Bells, Polished, Brass 60& @60&10%
White Metal 60%
Nickel Plated 50@50&5%
Swiss 60@60&7½%
Cone's Glove Hand Bells 33⅓&33⅓&10%
Silver Chime 33⅓&33⅓&10%

Miscellaneous—

Farm Bells lb. 2@3¼c
Steel Alloy Church and School 60@60&5%
American Tube & Stamp'g Co. Gongs 75%
Table Call Bells 50&5&10%
Trip Gong Bells 55&10@60%

Belting— Rubber—

Agricultural (Low Grade) 75@75&5%
Common Standard 70@70&10%
Standard 65@70%
Extra 60&5@60&10%
High Grade 50&5@50&10%
Boston Belting Co.:
Seamless Stitched Imperial 45&5%
Boston 50&5%
Niagara 60&5%

Leather—

Extra Heavy, Short Lap 60@60&5%
Regular Short Lap 60&10@60&10&10%
Standard 70@70&5%
Light Standard 70&10%
Cut Leather Lacing 60&10%
Leather Lacing Sides, per sq. ft. 18c

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 30%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $30.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden 70&10@75&5%
Hollow Steel Blocks, with Ford's Patent Sheaves 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron 50&10%
Stowell's Self Loading 60%
See also *Machines, Hoisting.*

Boards, Stove—

Zinc, Crystal, &c. 30&10@40&10%

Bolts—

Carriage, Machine, &c.—

Common Carriage 75@75&10%
Phila. Eagle, $5.00 list May 24, '99 80@80&5%
Bolt Ends, list Feb. 14, '95 75&10%
Machine 75&10@75&15%
Machine with C & T. Nuts 70&10%

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch	3	4	5	6	8
Per doz	$0.26	.30	.39	.47	.65

Cast Iron Spring Foot:

Inch	6	8	10
Per doz	$1.00	1.35	1.75

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz	$0.75	1.05	1.50

Cast Iron Shutter, Brass Knobs:

Inch	6	8	10
Per doz	$0.57	.80	1.00

Wrt Barrel, Jap'd 75&10@75&10&10%
Wrought " Bronzed 50&5@50&10%
Wrought Flush, B. K. 50&10@60&10%
Wrought Shutter 40&10&10@60&5%
Wrought Square Neck 50@50&10%
Wrought Sunk, Flush 50@50&10%
Ives' Patent Door 60%

Stove and Plow—

Plow 60@60&5%
Stove 50&5@30&10&5%

Tire—

Common 78½@72½&10%
Norway Iron 80@80&5%
American Screw Company:
Norway Phila., list Oct. 16, '04 80%
Eagle Phila., list Oct. 16, '04 82½%
Bay State, list Dec. 28, '99 72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '04 80%
Eagle Phila., list Oct. 16, '04 82½%
Eclipse, list Dec. 28, '99 72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99 72½%
Norway Phila., list Oct. '84 80%
Upson Nut Co.:
Tire Bolts 72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch	1¼	1⅜	1½	2
Per doz	$4.30	5.00	5.75	7.25

Inch	2¼	2½
Per Doz	$8.65	11.50

Enterprise Mfg. Co., No. 1, $1.35; No. 2, $1.65; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25&10%
Langdon 45&10%
Perfection ₩ doz. $3.00
Schatz 60%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American $1.15@1.35
Barber's 50&10&10@60&10%
Fray's Genuine Spofford's 60%
Fray's No. 70 to 120, 81 to 129, 207 to 414 60%
C. E. Jennings & Co. 50&5&10%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Patent 50%
Millers Falls Drill Braces 25&10%
P., S. & W. Co. Peck's Patent 60&10&5%

Brackets—

Wrought Steel 80@80&10%
Bradley's Wire Shelf:
Full cases 80&10&10%
Broken cases 30&10%
Griffin's Pressed Steel 50%
Griffin's Folding Brackets 70&10%
Stowell's Cast Shelf 20%
Stowell's Sink 20%
Western, W. G. Co., Wire 60&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Western, W. G. Co 40%
Wire Goods Co. 75@75&10%

Buckets, Well and Fire—See *Pails*

Bucks Saw—

Hoosier ₩ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts— Brass—

Wrought list Sept., '96 30@30&5%
Cast Brass, Tiebout's 50%

Cast Iron—

Fast Joint, Broad 50@50&10%
Fast Joint, Narrow 50@50&10%
Loose Joint 70&5@70&10%
Loose Pin 70&5@70&10%
Mayer's Hinges 70&5@70&10%
Parliament Butts 70&5@70&10%

Wrought Steel—

Table and Back Flaps 75%
Narrow and Broad 75%
Inside Blind 75&10%
Loose Pin 75%
Loose Pin, Ball and Steeple Tip 80&20%
Japanned, Ball Tip Butts 70&10%
Bronzed Wrt. Nar. and Inside Blind Butts 55&10%

Net Prices.

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series 25%
1200 series 33⅓%
200, 300, 600 and 900 series 40&10%
Hendryx Bronze.
700, 800 series 40&10%
Hendryx Enameled 40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong per lb. 5@5½c
Sharp, 1 prong per lb. 4½@5c
Perkins' Blunt Toe cents, ₩ lb 35
Perkins' Sharp Toe cents, ₩ lb 45

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 50	2.00	2.25	each.
Iowa Pattern...	....	2.35	2.50	each.
	20	30	40	qts.
New York Patt'rn	1.65	2.40	2.75	each.
Baltimore Patt'rn	....	1.80	2.00	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.	
$48.00	64.20	129.60	gro., net

Caps—Percussion—

Eley's E. B. 60c
G. D ..... *per M* 34@35c
F. L. ..... *per M* 40@45c
G. E. ..... *per M* 50@55c
Musket ..... *per M* 62@63c

Primers—

Berdan Primers, $2.00 per M... 20&5%
B. L Caps (Sturtevant Shells) $2.00 per M 20%
All other primers per M.$1.52@$1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ..... 10&5%
38 C. F., $7 00 ..... 10&5%
22 cal. Rim, $1 50 ..... 10&5%
32 cal. Rim. $2.75 ..... 10&5%
B. B. Caps, Con. Ball Swgd $1 90
B. B. Caps, Round Ball $1.40
Central Fire 25%
Target and Sporting Rifle ..... 15&5%
Primed Shells and Bullets ..... 15&10%
Rim Fire Sporting 50%
Rim Fire, Military ..... 15&5%

Cases, Show—

Sun, No. 102. Silent Salesman, 6 ft., $25.00

Casters—

Bed ..... 70@70&10%
Plate ..... 60&5@60&10%
Philadelphia ..... 75@75&5%
Boss ..... 70&10%
Boss Anti-Friction ..... 70&10%
Gem (Roller Bearing) ..... 75&10%
Martin's Patent (Phœnix) 45%
Smith & Hemenway Co. ..... 33⅓&10%
Standard Ball Bearing 45%
Tucker's Patent low list 30%
Yale (Double Wheel) low list 45%

Cattle Leaders—

See *Leaders, Cattle*

Chai Coil—

American, Coil, Jobbers' Shipments:

3-16	¼	5-16	⅜	7-16	½	9-16
3.00	3.50	4.15	3.75	3.60	3.50	3.45
⅝	¾	⅞	1 to 1¼ inch.			
3.30	3.25	3.50	3.15	per 100 lb.		

German Coil ..... 60&10@10%

Halters and Ties—

Halter Chains ..... 60@10@60@10@10%
German Halter Chains, list July 24, '97 ..... 60@10&10@70@10%
Cow Ties ..... 60@60@10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pair
6¼—6-3, Straight, with ring...$24.00
6¼—6-2, Straight, with ring.. $24.50
6¼—8-2, Straight, with ring.. $28.00
6¼—10-2, Straight, with ring..$33.00
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains.. 60&5@60@10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... 60@10@60@10@10%
Brass ..... 60@10@60@10@10%
Safety Chain ..... 70@10@75@5%
Gal. Pump Chain ..... *lb* 4¼@4¾c
Covert Mfg. Co.
Breast ..... 40&2%
Halter ..... 40&2%
Heel ..... 40&2%
Rein ..... 40&2%
Stallion ..... 40&2%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back 70%
Rein 70%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Eureka Coil and Halter ..... 45@50&5%
Niagara Coil and Halters ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50@10&5%
Niagara Wire Dog Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain ..... 70&10%
Universal Dbl-Jointed Chain 50%

Chalk—(From Jobbers.)

Carpenters' Blue ..... *gro.* 40c
Carpenters', Red ..... *gro.* 55c
Carpenters', White ..... *gro.* 30c
See also Crayons.

Checks, Door—

Bardsley's 45%
Columbia ..... 50&10%
Eclipse ..... 60&10%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 55%
Youths' Chests, with Tools 40%
Gentlemens' Chests, with Tools 30%
Farmers', Carpenters', etc, Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 50%
C. E. Jennings & Co.'s Machinists' Tool Chests ..... 33⅓&10%

Chisels—Socket Framing and Firmer

Standard List ..... 70@70&10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Socket Firmer No. 10 ..... 60&10%
C. E. Jennings & Co. Socket Framing No. 15 ..... 60&10%
Swan's 70%
L. & I. J. White ..... 30@30&5%

Tanged—

Tanged Firmers ..... 40@5@40&10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Nos. 191, 181 ..... 16⅔&10%
L. & I. J. White, Tanged ..... 35@20%

Cold—

Cold Chisels, good quality..lb. 13@15c
Cold Chisels, fair quality..lb. 11@12c
Cold Chisels, ordinary ..... lb. 9 @10c

Chucks—

Beach Pat., each $8.00.. ..... 35&5%
Pratt's Positive Drive 25%
Empire 25%
Blacksmiths' 25%
Skinner Patent Chucks:
Combination Lathe Chucks 40%
Drill Chucks, Patent and Standard 30%
Drill Chucks, New Model 20%
Independent Lathe Chucks 40%
Improved Planer Chucks 25%
Universal Lathe Chucks 40%
Face Plate Jaws 40%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination 50%
Czar Drill 35%
Combination Geared Scroll 40%
Geared Scroll 40%
Independent 50%
Independent Steel 40%
Union Drill 45%
Universal 50%
Independent Iron Face Plate Jaws 40%
Independent Steel Face Plate Jaws 40%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 45%
Little Giant Double Grip Drill 45%
Little Giant Drill, Improved 45%
Oneida Drill 45%
Scroll Combination Lathe 45%

Clamps—

Adjustable, Hammers' ..... 20@20&5%
Cabinet, Sargent's ..... 50&10%
Carriage Makers', P., S. & W. Co. 50%
Carriage Makers' Sargent's 60%
Beaty, Parallel ..... 33⅓&10%
Linemans' Utica Drop Forge & Tool Co. 40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Drain—

Iwan's Champion, Adjustable 55%
Iwan's Champion Stationary 40%

Sidewalk—

Star Socket, All Steel ..... ℔ doz. $4.05 net
Star Shank, All Steel ..... ℔ doz. $3.24 net
W. & C. Shank, All steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros. 30%
New Haven Edge Tool Co.'s 45%
Fayette R. Plumb ..... 33⅓&33⅓&10%
L. & I. J. White 30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse ..... $8.75 } 15%
1902 Chicago Horse ..... $10.75 }
20th Century Horse, each, $5.00 ..... 20%
Lightning Belt ..... $15.00 }
Chicago Belt ..... $20.00 } 15%
Stewart's Patent Sheep ..... $18.50 }

Finger Nail Clippers—

Smith & Hemenway Co. ..... doz. net $2.00

Clips, Axle—

Eagle and Superior ¼ and 5-16 inch ..... 70@10%
Norway, ¼ and 5-16 inch..70@70@10%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression and Plain Bibbs.....
65@10@70%
Globe, Kerosene, Racking, &c.. Cocks ..... *65@5@70@5%*

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—

Brass, Walter B. Stevens & Son's list. 40%
Embossed, Gilt, Walter B. Stevens & Son's list ..... 30&10%
Leather, Walter B. Stevens & Son's list 40%

Combs, Curry—

Metal Stamping Co ..... 20&10%

Mane and Tail—

Covert's Saddlery Works ..... 60&10%

Compasses Dividers, &c.

Ordinary Goods ..... *75@5@75@10%*
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Double 65%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Compasses 50%

Compressors, Corn Shock—

J. B. Hughes' ℔ doz. $2.50

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
A. Eastern.	*75&7½%*	*75@2½%*
B. Eastern	*75&7½&5%*	*75@7½%*
Central.	*75&7½%*	*75%*
Southern	*70&10%*	*70@5%*
S. Western.	*70&7½%*	*70@2½%*

Terms, 60 days, 2% cash, 10 days. Factory shipments generally delivered.
See also *Eave Troughs.*

Coolers, Water—

Gal. each.	2	3	4	6	8	
Labrador	$1.20	$1.50	$1.80	$2.10	2.70	
Gal.	3	4	6	8		
Iceland, ea.	$1.80	$2.10	2.40	$3.00		
Gal.	2	3	4	6	8	
Galv. Lined Ea.	$1.35	$2.00	$2.2	$2.90	$3.90	25%
Ga.v. Lined side handles Gal.	2	3	4	6	8	
Each.	$1.93	$2.15	$2.40	$3.50	$4.15	25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab ..... *lb.* 35c
Braided, White, Com ..... *lb.* 23@25c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India ..... *lb.* 10@10½c
Cotton Sash Cord, Twisted ...20@25c
Patent Russia ..... *lb.* ..@14c
Cable Laid Russia ..... *lb.* ..@15c
India Hemp, Braided ..... *lb* ..@18c
India Hemp, Twisted ..... *lb.* 12@13c
Patent India, Twisted ..... *lb.* 12@13c
Anniston Cordage Co.: Braided Cotton.
Old Glory, Nos. 7 to 12 ..... ℔ lb. 30 ¢
Anniston, Nos. 7 to 12 ..... ℔ lb 25 ¢
Old Colony, Nos. 7 to 12 ..... ℔ lb 25 ¢
Anniston Drab, Nos. 7 to 12... ℔ lb 20 ¢
Pearl Braided, cotton, No. 6 ℔ lb., 24¢; Nos. 7 to 12 23¢.
Eddystone Braided Cotton No. 6 ℔ lb. 27¢
Harmony Cable Laid Italian. No. 7 to 10 ..... ℔ lb 23¢
Peerless:
Cable Laid Italian ..... 16¢
Cable Laid Russian ..... 14¢
Cable Laid India ..... 12¢
Braided India ..... 18¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton ..... ℔ lb 36½¢
Braided, Italian Hemp... ..... ℔ lb 36¢
Braided, Linen ..... ℔ lb 53¢
Braided, White Cotton or Spot. ℔ lb 38¢
Massachusetts, White ..... ℔ lb 28 ¢
Massachusetts, Drab ..... ℔ lb 32 ¢
Phœnix, White, No's 7 to 12..... 24¢
No. 6 cords, 1¢ extra.
Silver Lake:
A quality, Drab ..... 40¢
A quality, White ..... 35¢
B quality, Drab ..... 35¢
B quality, White ..... 30¢
Italian Hemp ..... 40¢
Linen ..... 57½¢

Wire, Picture—

List Oct.,'00.....85&10@85&10@10&5%

Cradles—

Grain ..... *40@12½%*

Crayons—

White Round Crayons, gross.5½@6c
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.
Jumbo Crayons ..... gr. $3.50 } 20% Case lots
Metal Workers' Crayons. gr. $2.50
Soapstone Pencils, round, flat or square ..... gr. $1.50
Rolling Mill Crayons..... gr. $2.50
Railroad Crayons (composition) gr. $2.00
Zelnicker's Lumber:
Red, Blue, Green ..... ℔ gro. $6.50
Black ..... ℔ gro. $4.00
See also *Chalk.*

Crooks, Shepherds'—

Fort Madison, Heavy ..... ℔ doz. $7.00
Fort Madison, Light ..... ℔ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847 ..... ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ℔ doz. $3.00
Wm. Rogers & Son ..... ℔ doz. $2 50
Simeon L. & Geo H. Rogers Company:
12 dwt. Medium Knives..... ℔ doz. $3.00
No. 77 Medium Knives..... ℔ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co 40%
Red Devil 50%
Smith & Hemenway Co 70%
Woodward 40%

Meat and Food—

American 30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise ..... 25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's, ℔ doz. ..... 30&10@40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal ..... 41&10@50%
Little Giant, ℔ doz. ..... 33⅓@40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$71.00	$68.00

N. E. Foo l Chopper 40%
New Triumph No. 605, ℔ doz. 224.00 ..... 30&10@40%
Russwin Food No. 1, $24 00; No. 2, $27.00 ..... 45&10&10%
Sterling ..... 40@40&1 %
No 1 ....$2.00 each No. 2 . $2.50 each
Woodruff's, ℔ doz ..... 30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers ..... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c 40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12..... 40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife ..... ℔ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ℔ doz. $4.00
Sterling $6.00 each 33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters 40%
Slaw Cutters, 1 Knife, ℔ gr.... $18@$30
Slaw Cutters, 2 Knife, ℔ gr.... $22@$36

Tobacco—

All Iron, Cheap.....doz. $4.25@$4.50
Enterprise ..... 25@50%
National, ℔ doz. No. 1, $21; No. 2, $18.. 40%
Sargent's, ℔ doz., No. 2 ..... 60%
Sargent's No 12 and 21 ..... 60&10%

Washer—

Appleton's, ℔ doz. $16.00..... 50&10&10%
Bonney's 33⅓%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz. $9.00
Iwan's Improved Post Hole Auger. 40&5%
Iwan's Vaughan Pattern Post Hole Augers, ℔ doz $6.50
Iwan's Perfection Post Hole Digger... ℔ doz. $8.50
Iwan's Split Handle Post Hole Diggers, ℔ doz $7.50
Kohler's Universal ..... ℔ doz. $15.00
Kohler's Little Giant ..... ℔ doz. $12.60
Kohler's Hercules ..... ℔ doz. $10.00
Kohler's Invincible ..... ℔ doz. $9 60
Kohler's Rival ..... ℔ doz. $8.50
Kohler's Pioneer ..... ℔ doz. $7.50
Never-Break Post Hole Diggers, ℔ doz. $24.00 ..... 60%
Samson, ℔ doz. $34.00 ..... 35%

Dividers—See *Compasses.*

Doors Screen—

Phillips', style E, ¼ in. ..... ℔ doz. $10.50
Phillips', style 077, ¼ in. ..... ℔ doz. $8.03
Phillips', style x-y, ¼ in .... ℔ doz. $11.00
Porter's Plain, No. 6 ..... ℔ doz. $6 75
Porter's Ornamental, No. 70, ℔ doz. $10.50
Porter's No. 90 ..... $9.00
Porter's No. 44 ..... $10.75

Drawers, Money—

Sun Money Drawers, No. 5, ℔ doz. $9.50; No. 6, with Bell, $10.60; No. 6, with Gong, $10.50.
Tucker's Pat. Alarm Till No. 1, ℔ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmiths' Drill..each $1.50@$1.75
Breast, Millers Falls ..... 15&10%
Breast, P., S. & W ..... 40&5%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3 ..... 16⅔&10%
Johnson's Drill Points..... 16⅔&5&10%
Millers Falls Automatic Drills... 33⅓&10%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's 33⅓%
Ratchet, Whitney's, P. S. & W 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00..... 33⅓%

Twist Drills—

Bit Stock ..... *60@10@60@10&10%*
Taper and Straight Shank ..... *60@10@60@10&5%*

Drivers, Screw—

Screw Driver Bits..per doz. ..45@75c
Baisey's Screw Holder and Driver, ℔ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9.. 40%
Buck Bros' Screw Driver Bits 30%
Champion 50%
Edson 60%
Fray's Hoi. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet 35%
Goodell's Auto 50&10&10@50&10&10&5%
Hurwood 40%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 40&10%
Millers Falls, Nos. 20 and 21 ..... 25&10%
Millers Falls, Nos. 11, 12, 41 42..... 15&10%
Never Turn 60%
New England Specialty Co. 50%
Sargent & Co.'s:
Nos. 1 and 60 ..... 50&10&10%
Nos. 50 and 55 ..... 60&10%
Nos. 20 and 40 ..... 70&10%
Smith & Hemenway Co ..... 40&5%
H. D. Smith & Co.'s, Perfect Handle... 40%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles 50@60&10&10%
No. 86 ..... 70@70&10&10%
Swan's:
Nos. 65 to 68 ..... 50%
No. 40 ..... 40&10%
Nos. 25, 35 and 45 ..... 20&10&10%

Eave Trough, Galvanized

Territory.	*L. C. L.*
A. Eastern	*80&10%*
B. Eastern	*80&10&5%*
Central	*80&10%*
Southern	*75&10&5%*
S. Western	*75&10&5%*

Terms, 2% for cash. Factory shipments generally delivered.
See also *Conductor Pipe and Elbows.*

Elbows and Shoes—

Factory shipments *60%*
Perfect Elbows (S. S. & Co.) 30%

Emery, Turkish—

	4 to 16	5½ to 150	Flour
Kegs	*lb.* 5c	5½c	3½c
½ Kegs	*lb.* 5½c	5¾c	3¾c
Kegs	*lb* 5c	6c	
10-lb cans.10 in case	6½c	7c	8c
10-lb. cans, less than 10.	10c	10c	8c

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 50&10%
Walling's 50%

Cord and Weight—

Ives 40%

Faucets—

Cork Lined ..... *50@50&10%*
Metallic K ¼, Leather Lined 70@70&10%
Red Cedar ..... *40@40&10%*
Petro'eum ..... *70&10@75%*
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key.... 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Metal Key. 50&10%
John Sommer's Duplex Metal Key.... 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined..... 50%
John Sommer's No Br nd, Ce lar..... 50%
John Sommer's Perfection Cedar..... 40%
McKenna, Brass:
Burglar Proof, N. P 35%
Improved ¼ and ⅜ inch 35%
Self Measuring:
Enterprise, ℔ doz. $36.00..... 40&10%
Lane's, ℔ doz. $36.00..... 40&10%
National Measuring, ℔ doz. $36..40&10%

Felloe Plates—

See *Plates, Felloe.*

Files—Domestic—

List revised Nov. 1, 1899.
Best Brands ..... *70@5@70@10@5%*
Standard Brands. *75@5@75@10@10%*
Second Quality.....75@10@10@80@5%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 30%

Fixtures, Grindstone—

Net Prices:

Inch....	15	17	19	21	24
Per doz.	$2.75	3.35	3.25	3.75	4.50

P., S & W. Co ..... 30&10@40%
Reading Hardware Co 60%
Sargent's ..... 60&10&10%
Stowell's Giant Grindstone Hanger.... ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy ..... 50&10&10%
Stowell's Grindstone Fixtures Light... 60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

Base Discounts Aug. 1, 1899, list:
Hay, 2 tine.....50&10&5%
Boys'. & Fish, 2 tine.....50&10&5%
Hay & Boys', 3 tin.....60&5%
Hay & Boys', 4 tine.....66⅔%
Champion Hay.....66⅔%
Hay & Header, long 3 tine.....6.%
Header, 4 tine.....65%
Barley, 4 & 5 tine, Steel.....60&2.%
Manure, 4 tine.....60&15&2½%
Manure, 5 and 6 tine.....66⅔&2½%
Spading.....70&2½%
Potato Digger, 6 tine.....60&10%
Sugar Beet.....40&10%
Coke & Coal.....40&10%
H-avy Mill & Street.....65%
Iowa Dig-Eay Potato.....65%
Victor, Hay.....60⅔%
Victor, Manure.....66⅔%
Victor, Header.....66⅔%
Champion, Hay.....66⅔%
Champion, Manure.....60&20%
Columbia, Hay.....66⅔&5%
Columbia, Manure.....70%
Columbia, Spading.....70&10%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger.....60&12½%
Acme Hay.....60&10&5%
Acme Manure, 4 tine.....60&20&7½%
Dakota Header.....65&15&5%
Jackson Steel Barley.....65&15&5%
Kansas Header.....66⅔%
W. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons*.

Fountains, Stock—

Double Dewey.....₱ doz. $13.00

Frames— Saw—

White, Straight Bar, per doz. 75@80c
Red, Straight Bar, per doz $1.00@$1.25
Red, Double Brace, per doz. $1.40@1.50

Freezers Ice Cream— Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp.....$2.75
Cotton.....3.20
Waterproof Single Taped..3.65
Waterproof Double Taped..4.40
Waterproof Triple Taped..5.15
Extra 50

Gates, Molasses and Oil—

Stebbins' Pattern....30&5@80&10&5%

Gauges—

Marking, Mortise, &c......
50&10&5@50&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, etc.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....5.@50&10%
Fulton's Butt Gauge.....30&10%
Stanley R. & L. Co.'s Butt & Babbet Gauge.....20@20&10&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....30&10%

Gimlets— Single Cut—

Nail, Metal, Assorted, gro. $1.50@1.80
Spike, Metal, Assorted gro. $2.80@3.50
Nail, Wood Handled, Assorted, gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $4.25@4.50

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co.....60@60&10&10%

Glue—Liquid Fish—

Bottles or Cans, with Brush....25@50%
Cans (½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's).....40&10@50%

Grease, Axle—

Common Grade.....*gro.* $4.50@5.50
Dixon's Everlasting....10-₱ pails, ea. 85¢
Dixon's Everlasting, in bxs..₱ doz. 1 ₱ $1.20; 2 ₱ $2.00

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz.....$2.00
Pike Mowe: Knife and Tool Grinder, each.....$4.00
} 33⅓%
Velox Ball Bearing, mounted, Angle Iron Frames.....each, $3.25

Halters and Ties—

Covert Mfg. Co.:
Web.....45&2%
Jute Rope.....40&5&5%
Sisal Rope.....20&5%
Covert's Saddlery Works:
Web and Leather Halters.....20%
Jute and Manila Rope Halters.....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties..70%
Sisal Rope Ties.....60&10%

Hammers—Handled Hammers—

Heller's Machinists'..40&10&40&10&10%
Heller's Farriers.....40&10&40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40&40&10&10%
Peck, Stow & Wilcox.....40&10&5%
Fayette R. Plumb:
Plumb, A. E. Nail..33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand.....
50&7½&5@50&10&7½&5%
Machinists' Hammers50&5@50&10&5%
Riveting and Tinners'.....
40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

Under 3 lb.....*lb* 5c
3 to 5 lb.....*lb* 4c
Over 5 lb.....*lb*. 30c
} 80@80&10%
Wilkinson's Smiths'.....9½c@10c lb.

Handles—Agricultural Tool Handles—

Axe, Pick, &c.....4.@50&5%
Hoe, Rake, &c.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handle.

Auger, assorted.....*gro.* $2.50@2.85
Brad Awl.....*gro.* $1.65@$1
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.40@$2.65
Hickory Tanged Firmer, gro. ass'd. $2.15@$2.40
Apple Socket Firmer, gro. ass'd. $1.75@$1.95
Hickory Socket Firmer, gro ass'd. $1.45@$1.60
Hickory Socket Framing, gro. ass'd. $1.60@$1.75
File, assorted.....*gro.* $1.30@$1.40
Hammer, Hatchet, Axe, &c.....50%
Hand Saw, Varnished, doz .80@85c
Not Varnished.....65@75c
Plane Handles:
Jack doz.50c; Jack Botted.....75c
Fore, doz.....45c; *Fore, Bolted*.. 90c
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle, ₱ gro.....$0.85@$1.50

Hangers—

NOTE.—*Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.*

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Single Doz.	$0.90	1.25	1.60	1.95	2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch	3	4	5	6
Single Doz.	$1.30	1.85	2.50	3.00

Alith Mfg. Co.
Reliable No. 1.....per doz. $12.00
Reliable No. 2.....per doz. $15.00
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60%
Roller Bearing.....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.15
Parlor, Standard.....$3.35
Parlor, New Model.....$3.75
Parlor New Champion.....$2.25
Barn Door, Standard.50&10&10&5%
Hinged.....$6.40
Covered.....50&10&10%
Special.....50&10&10&5%
Lawrence Bros.:
Advance.....60%
Cleveland.....60&10%
Crown.....60%
Giant.....50&10%
New York.....60%
Peerless.....60&10%
Sterling.....60%
Swing, No. 95.....60%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60%
C. S. Smith Mfg. Co.:
Lundy Parlor Door.....50&10%
Monarch Barn Door.....60&10%
Never Jump Hinge.....50&10%
Peerless.....60&10%
Perfection.....70&5%
Phœnix.....70&5%
Wagner's Adjustable.....70&10%
Warehouse Anti-Friction.....60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3.....$2.25
Imp'd Wood Track No. 5.....$2.25
Imp'd Steel Track No. 7.....$2.70
Imp'd Steel Track No. 7.....$2.65
Ball B'r'g Steel Track No. 9.....$2.50
Ball B'r'g Steel Track No. 10.....$2.50
Roller B'r'g Steel Track No. 11...$2.45
Roller B'r'g Steel Track No. 12...$2.40
Ball B'r'g Steel Track No 13..$2.75
Roller B'r'g Steel Track No. 14 $2.65
Ball B'r'g Trolley Track No. 15 .40%
Ball Brg Trolley Track No. 19...40&5%
Ball Bearing Tandem Trolley Track No. 16.....40%
Silent Adjustable Track No. 18...40%
Auto Adjustable Track No. 22...40%
Trolley B. D. No. 17.....$1.60
Trolley F. D. No. 120.....$2.70
Trolley F. D. No. 121.....$2.85
Trolley F. D. No. 151.....$3.00
Roller Bearing D. D. No. 25.....70&5
Roller Bearing U. S. B. D.....70&5%
Anti Friction B. D.....60&10%
Ives' Wood Track No. 1.....$2.15
Ives' Imp'd Wood Track No. 2..$2.15
Safety Door Hanger Co.:
Storm King Saftey.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. and Foundry Co.
Acme Parlor Ball Bearing.....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Freight Car Door.....60%
Interstate.....40&10%
Lundy Parlor Door..50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door.....55&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500.....50&10%
Underwriter's Fir Door.....40%
Wild West Warehouse Door.....50%
Zenith for Wood Track.....50&10%
A. L. Swett Iron Works:
Eagle.....60&10%
Hylo.....20&10%
Perfection.....60%
Pilot.....60%
Taylor & Boggis F'y Co.'s Kinder's Roller Bearing.....50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L.T. Roller Bearing.....60&10&5%
New Era Roller Bearing.....50&10%
O. K. Roller Bearing.....60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem Nos. 1 and 2.....60%
Underwriters' Roller Bearing ...40%
Velvet.....50%
Wilcox Auditorium Ball Bearing 20%
Wilcox Barn Trolley No. 128.....40%
Wilcox Elv. Door, Nos 112 and 122½.50%
Wilcox Elv. Door, No. 132.....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century.....50&10&10%
Wilcox O. K. Steel Track.....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing....40%
Wilcox Wideman Narrow Gauge, Ball Bearing.....40%
For Track, see *Rail*

Extra 50&10% often given.

Hangers, Garment—

Western, W. G. Co.....70&10%

Gate—

Myers' Patent Gate Hangers, ₱ doz net 4.50

Hasps—

McKinney's Perfect Hasp, ₱ doz.....5.%

Hatchets—

Regular list.....40@50%

Heaters, Carriage—

Clark, No. 3, $2.25; No. 2a, $2.5: No 3x, $2.25; No. 1, $3.50 each.....15%
Clark Coal, $0.75 ₱ doz.....10%

Hinges—Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1838 O. P. Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.85	1.75	3.50

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter, (Buffalo, &c.)

No.	1	1½	2
Doz. pair	$0.75	.70	.65

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70@75%
Reading's Gravity.....50&5%
Sargent's, Nos. 1, 3, 5, 11 & 13.....70&10@75%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80; with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter.....7 &5%
Acme, Lull & Porter.....55%
Queen City Reversible.....75%
Stenger's Positive Locking, Nos. 1 & 3.....70&10%
Shepard's Noiseless, Nos. 60, 65, 55...
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75%
Pins, Old Pat'n, Nos. 1, 3 & 5.....75%
Tip Pat'n, Nos. 1, 3& 5.....75%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75 .75%
Steamboat Gravity Locking, No. 10 .75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%
Whipple's Patent Automatic.....50%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	$1.50	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch.....*doz* ....@$2.00
Without Latch.....*doz.* ....@$1.20
Reversible Self-Closing:
With Latch.....*doz.* ....@$1.75
Without Latch.....*doz.* ....@$1.35
Western:
With Latch.....*doz.* $1.75
Without Latch.....*doz.* $1.15
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Spring Hinges—

Holdback Cast Iron gro...$9.00@9.50
Non-Holdback, Cast Iron.....
gro. $8.00@8.50
J. Bardsley
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges.....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House...25%
Keen's Saloon Door.....25%
Columbian Hdw. Co.:
Acme, Wrt. Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 14.....₱ gr. $9.00
Columbia, No. 18.....₱ gr. $25.00
Columbia, Adjustable, No. 7, ₱ gr. $12.00
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.50
Oxford, new list.....30%
Lawson Mfg. Co.:
Matchless.....35%
Matchless Pivot.....45%
Shelby Spring Hinge Co:
Crown Jamb Hinge.....40%
Chief Ball Bearing Floor Hinge.45%
Royal Ball Bearing Floor Hinge..45%
The Stover Mfg. Co:
Ideal, No. 16, Detachable, ₱ gr $12.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....35%

Extra 10% often given on most of these Hinges.

Extra 10&10&10&10&5%

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges.....80&5%
Heavy Strap Hinges 80&20&10%
Light T Hinges.....75&10&5%
Heavy T Hinges.....75&5%
Extra Heavy T Hinges..80&2.%
Hinge Hasps.....70%
Cor. Heavy Strap....80&20&10%
Cor Ex. Heavy T.....80&20

Extra 10&10@10&10&5%

Screw Hook and Strap:
6 to 12 in.....*lb.* 3½c
14 to 20 in.....*lb.* 3 c
22 to 36 in.....*lb.* 2¾c
Screw Hook and Eye:
¾ *to 1 inch*.....*lb.* 6 c
⅝ *inch*.....*lb.* 7 c
½ *inch*.....*lb.* 9 c

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers.....35%

Hods, Coal—

Inch	15	16	17	18
Galv. Open	$2.50	2.75	3.00	3.25
Jap. Open	$2.00	2.25	2.50	2.75
Galv. Funnel	$3.00	3.25	3.50	3.75
Jap. Funnel	$2.50	2.75	3.00	3.25

₱ doz.

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23 1899.....
70@70&10%
D. & H. Scovil.....35%

Handled—

Aug. 1, 1899, List:
Field and Garden.....70&10%
Smith's Patent.....50%
Meadow & Rhode Island.....75%
Black Diamond.....70&10%
Mortar and Street.....70&10&10%
Planters'.....75&12½%
Cotton.....70&10&10%
Cotton Chopper.....75&12½%
Weeding Hoes.....60%&15%
Steel Weeders.....60%&15%
Malleable Weeders.....60%&15%
Ft. Madison Cotton Hoe.....75&7½%
Ft. Madison Crescent Cultivator Hoe per doz.....75&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. $5.00
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.80
Ft. Madison Dixie Tobacco Hoe..75&20%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....55%
W. & C. Ivanhoe.....75&2%
B. B. 6 in. Cultivator Hoe.....$3.15
B. B. 8 in.....$3.35
Acme Weeding.....₱ doz. net, $4.35
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Empire.....50%
Bardsley's.....45%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&10%

Hooks—

Hooks, Bench, see *Stops, Bench.*

Cast Iron—

Bird Cage, Reading.....50&10%
Bird Cage, Sargent's List.....60%
Ceiling, Sargent's List.....50&10%
Clothes Line, Reading List.....50%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List..50@5 &10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....50%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....50&10%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....80&10%
Wire C. & H. Hooks.....70&10@75%
Atlas, Coat and Hat:
Single Cases.....70%
10 Case Lots.....70&10%
Columbian Hdw Co. Gem.....60&10%
Parker Wire Goods Co.: King.....70&10%

Wire Goods Co:
Acme ..... 60&10%
Chief 70%
Crown ..... 70&10%
Czar 65%
V Brace ..... 70&10%
Czar Harness ..... 50&10%

Wrought Iron—
Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton ..... doz. $1.05@1.25
Wrought Staples, Hooks, &c.—
See *Wrought Goods.*

Miscellaneous—
Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass ..... Nos. 1 2 3 4
Best $1.50 1.75 2.00
Common $1.30 1.50 1.50 1.60
Potato and Manure ..... 60&15%
Whipletree ..... lb. 6¾@6c
Hooks and Eyes:
Brass ..... 60&10&10@70%
Malleable Iron ..... 70&5@70&10%
Covert Saddlery Works' Self Locking Gate and Door Hook 60%
Ft. Madison Cut-Easy Corn Hooks, ₩ doz. $5.25 net
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*
Horseshoes—
See *Shoes, Horse.*

Hose Rubber—
Garden Hose, ¾-inch:
Competition ..... ft. 4¼@ 5 c
3-ply Standard ..... ft. 6½@ 7 c
4-ply Standard ..... ft. 7½@ 8 c
5-ply extra ..... ft. 8½@ 9 c
4-ply extra ..... ft. 10 @10½c
Cotton Garden, ¾-in., coupled:
Low Grade ..... ft. 6 @7 c
Fair quality ..... ft. 8 @9 c

Irons— Sad—
From 4 to 10 ..... lb. 3¾@3 c
B. B. Sad Irons ..... lb. 3¼@3½c
Chinese Laundry ..... lb. 4¾@5c
Chinese Sad ..... lb. 4@4¼c
Mrs. Potts', per set:

Nos.	*50*	*55*	*60*	*65*
JapdTops	*71*	*68*	*81*	*78*
TinaTops	*74*	*71*	*84*	*81*

New England Pressing, lb. .. 3¾@4c

Pinking—
Pinking Irons ..... doz. 50@60c

Soldering—
Soldering Coppers 2½ and 3 .. 19@20c
1¼ and 2 ..... 21@22c

Jacks Wagon—
Covert Mfg. Co.:
Auto Screw ..... 30&5%
Steel ..... 45&2%
Covert's Saddlery Works':
Daisy ..... 60&10%
Victor ..... 60&10%
Lockport 50%
Lane's Steel ..... 30&10%

Kettles—
Brass, Spun, Plain ..... 20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c. 30%
Smith & Homeaway Co ..... 40&10%
Wilkinson Shear & Cutlery Co. 50%
Hay and Straw—See *Hay Knives.*

Corn—
Withington Acme, ₩ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List ..... 70&5@70&10%
Bradley's 35%
C. E. Jennings & Co. Nos. 45, 46 .. 60&10%
Jennings & Griffin Nos. 51, 52, 60 & 10&10%
Swan's ..... 70&10&2½%
Watrous ..... 10½&10%
L. & L. J. White ..... 20&5@25%

Hay and Straw
Lightning ..... ₩ doz. $6.50@7.00
Iwan's Sickle Edge ..... ₩ doz. $10.00
Iwan's Serrated ..... ₩ doz. $10.00
Maine ..... ₩ doz. $8.50

Mincing—
Buffalo ..... ₩ gro. $13.00

Miscellaneous—
Farriers' ..... doz. $3.00@3.25
Wostenholm's ..... ₩ doz. $3.00@3.25

Knobs—
Base, 2¼-inch, Birch, or Maple, Rubber tip, gro ..... $1.10@1.15
Carriage, Jap, all sizes .. gro. 40@45c
Door, Mineral ..... doz. 65@70c
Door, Por. Jap'd ..... doz. 70@75c
Door, Por. Nickel .... doz. $2.00@2.15
Bardsley's Wood Door, Shutter, &c. .. 15%
Picture, Sargent's ..... 60&10&10%

Lacing Leather—
See *Belting Leather—*

Ladders, Step, Etc.—
Lane's Store 25%
Myers Noiseless Step Ladders 30%

Ladies' Melting—
L. & G. Mfg. Co, Low List 25%
P. S. & W. 50%
Reading 60%
Sargent's ..... 45&10%

Lanterns— Tubular—
Regular Tubular No. 0, doz. $4.35@4.75
Lift Tubular .. No. 0 .. doz. $4.75@5.25
Hinge Tubular No. 0 .. doz. $4.75@5.25
Other Styles ..... 40&10@10&10&5%

Bull's Eye Police—
No. 1, 2¾ inch ..... $2.50@2.75
No. 2, 3 inch ..... $2.75@3.00

Lasts and Stands Shoe—
Stowell's Atlas, Malleable Iron 30%
Stowell's Badger, Cast Iron 30%

Latches—
Thumb—
Roggin's Latches, with screws, doz. 35@40c

Leaders Cattle—
Small ..... doz. 55c; large, 60c
Covert Mfg. Co. ..... 45&2%

Lifters, Transom—
R & E. 33⅓%

Lines—
Wire Clothes, Nos... 18 19 20
100 feet $2.20 2.00 1.65
75 feet $1.80 1.70 1.30
Samson Cordage Works.
Sash Braided Chalk, No. 0 to 3 ..... 40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gr. 20%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4 $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½ $2.50; No. 4, $3.50; No. 4½, $4.50 .... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 .... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft. $5.25.. 20%
Anniston Waterproof Clothes, 50 ft., ₩ gro.: $26.00; Gilt Edge, $24.00; Air Line $24.00; Acme, $19.00; Alabama, $17.00; Empire, $16.00; Advance, $15.00; Oriole, $22.00; Albermarle, $15.00; Eclipse, $13.50; Chicago, $12.50; Standard, $11.00; Columbia, $9.50.

Locks— Cabinet—
Cabinet Locks ..... 33⅓&5@33⅓&10&7½%

Door Locks, Latches, &c.—
[Net prices are very often made on these goods.]
Reading Hardware Co. 50%
R. & E. Mfg. Co. 40%
Sargent & Co. ..... 40&10%
Stowell's Steel Door Latches 50%

Elevator—
Stowell's 50%

Padlocks—
Wrought Iron ..... 75&10&25@50&25%
R. & E. Mfg. Co. Wrt. Steel and Brass ..... 75@75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass 62½%
Crescent 30%
Iron 62½%
Wrought Bronze and Brass 55%
Wrought Steel 55%
Reading ..... net 50%

Machines— Boring—
Com., Upright, Without Augers .. $2.00
Com., Angular, Without Augers .. $2.25
Without Augers.

R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3	$4.25	No. 1 $5.00
Improved No. 4	3.75	No. 2. 3.38
Improved No. 5	2.75	
Jennings'	No. 4, 3.15	No. 1, 3.50
Millers' Falls		5.75
Snell's, Rice's Pat.	2.50	2.75

Corking—
Reisinger Invincible Hand Power ..... ₩ doz. $48.00

Fence—
Williams' Fence Machines ..... each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%

Ice Cutting—
Chandler's ..... 15&10%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1; Boss Rotary	$57.00
Boss No. 7; Dietz Rotary	60.00
Champion Rotary; Banner No. 1	54.00
Standard Champion No. 1	48.00
Standard Perfection	36.00
Cintl Square Western	60.00
Uneeda American, Round	29.00

Mallets—
Hickory ..... doz. $1.50
Lignumvitæ ..... doz. $2.50
Tinners', Hickory and Applewood, doz ..... 50@55c

Mashers, Vegetable—
Western, W. G. Co., Potato ..... 60&10%

Mats— Door—
Elastic Steel (W.G. Co.) 10%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk*
Mills— Coffee, etc.—
Enterprise Mfg. Co. ..... 25@30%
National, list Jan. 1, 1902 ..... 30%
Parker's Columbia & Victoria. 50&10@60%
Parker's Box and Side ..... 50&10@60%
Sun, No. 1080, 1 ₩ mill ..... ₩ doz $3.00
Swift, Lane Bros Co. 30%

Mowers, Lawn—
Net prices are generally quoted.
Cheap ..... all sizes. $1.90@1.95
Good ..... all sizes, $2.25@3.50

	10	*12*	*14*	*16-inch*
High Grade	*4.25*	*4.50*	*4.75*	*5.00*

Continental ..... 60&5%
Great American 70%
Great American Ball Bearing, new list. 70%
Quaker City 70%
Pennsylvania ..... 60&5%
Pennsylvania, Jr., Ball Bearing 60%
Pennsylvania Golf 50%
Pennsylvania Horse ..... 10&5%
Pennsylvania Pony ..... 40&5%
Philadelphia:
Styles M., S., C., K. T. ..... 70&5%
Style A, all Steel ..... 60&5%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, low list .. 40&5%

Nails—
Cut and Wire. See Trade Report, Wire Nails and Brads, Papered, List July 20, 1899 .. 85&10&10@90%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C.	25	23	22	21	21	40&5%
C. B. K.	25	23	22	21	21	40%
Champ'n	28	26	25	24	23	50%
Maud S.	25	23	22	21	21	50%
Putnam	23	21	20	19	18	33⅓%
New "	19	18	17	16	16	10&10%

Jobbers' special brands, per lb. 3@3½c

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass Head	*.55*	*.60*	*.70*	*.95*	*1.00 gro.*
For. Head	*..*	*1.10*	*1.10*	*1.10*	*.. gro.*

Nippers, See *Pliers and Nippers.*
Nuts—
Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain $5.10
Hexagon, plain $5.60
Square, C. T. & R. $5.30
Hexagon, C. T. & R. $6.00
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank $6 00
Hexagon Blank $6.50
Square Tapped $6 00
Hexagon Tapped $6 50

Oakum—
Best or Government ..... lb. 6¼c
Navy ..... lb. 4¾c
U. S. Navy ..... lb. 5¼c
Plumbers' Spun Oakum 8¾c
In carload lots ¼c lb. off f.o b. New York.

Oil Tanks—See *Tanks, Oil.*
Oilers—
Brass and Copper ..... 60&10%
Tin or Steel ..... 70&10@75%
Zinc ..... 65&10%
Chase or Paragon:
Brass and Copper ..... 45&10@50%
Tin or Steel ..... 75@75&10%
Zinc 65%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
American Tube & Stamping Co.:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers etc, ... 60@60&10%

Openers— Can—
French ..... doz. 35c
Iron Handle ..... doz. 25@27c
Sprague, Iron Hdle .. per doz. 35@40c
Sardine Scissors .. doz. $1.75@$3.00
Marvel ..... per doz. $1.25
National 50%
Stowell's Sprague ..... per doz. 35@45c
Tip Top ..... per doz. $0.75
Triumph Shear ..... ₩ gro. $9.00

Egg—
Nickel Plate ..... per doz., $2.00
Silver Plate ..... per doz., $4.00

Packing—
Asbestos Packing, Wick and Rope, 11½@15c lb.

Rubber—
Sheet, C. I. ..... 8@10c
Sheet, C. O. S. ..... 9@15c
Sheet, C. B. S. ..... 10@11c
Sheet, Pure Gum ..... 60@65c
Sheet, Red ..... 50@50c
Jenkins' Standard, ₩ lb 80¢ .. 25@25&5%

Miscellaneous—
American Packing ..... 7@10c lb.
Cotton Packing ..... 16@25c lb.
Italian Packing ..... 9@12½c lb.
Jute ..... 4@4½c lb.
Russia Packing ..... 8@11c lb.

Pails— Creamery
S. S. & Co., with gauges.. No 1 $6.25; No. 2, $5.50 ₩ doz.

Galvanized—
Price per doz.

Quart	*10*	*12*	*14*
Water, Regular	*1.50*	*1.75*	*2.00*
Water, Heavy	*2.75*	*3.00*	*3.25*
Fire, Rd. Bottom	*2.30*	*2.60*	*2.80*
Well	*2.25*	*2.50*	*2.75*

Pans— Dripping—
Standard List ..... 60&10@60&10&5%

Fry—
Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.85*	*1.00*	*1.10*	*1.30*	*1.50*

Roasting and Baking—
Regal, S. S. & Co., ₩ doz., Nos. 5, $4.50; 10 $5.25; 20, $5.75; 30, $6.25.
Savory, ₩ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₩ gro.:

No.	40	50	60	140	150	160
	$30.00	35.10	42.00	31.00	39.00	46.00

Paper—Building Paper—

Asbestos:	*lb.*
Building Felt	*2¾c*
Mill Board, sheet, 40 x 40 inches	*3½c*
Mill Board, roll, thicker than 1-16 inch	*3½c*
Mill Board, roll, 1-16 in. thick and less	*2½c*

	Per roll
Rosin Sized Sheathing:	*500 sq. ft.*
Light wt., 25 lbs. to roll	*$0.40@0.45*
Medium wt., 30 lbs. to roll	*0.45@0.50*
Heavy wt., 40 lbs. to roll	*0.65@0.70*

Black Water Proof Sheathing, 500 Sq ft., 1 ply, 60c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 2, 6 and 4½ sq. ft. to lb., ton $41.00
Red Rope Roofing, 250 sq. feet per roll $1.75
NOTE.—*These goods are often sold at delivered prices.*

Tarred Paper.
1 ply (roll 300 sq. ft.), ton .. $32.50@35.50
2 ply, roll 108 sq. ft. ..... 55@60c
3 ply, roll 108 sq. ft. ..... 78@80c
Slater's Felt (roll 500 sq. ft.) 75c
NOTE.—*Above prices often include delivery, and are for Eastern territory, where prices are controlled by agreement between the manufacturers. In open territory much lower prices are current.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.00

Sand and Emery—
Flint Paper and Cloth .. 50&10@60%
Garnet Paper and Cloth 35%
Emery Paper and Cloth .. 50&10@60%

Parers— Apple—
Advance ..... ₩ doz. $4.50
Baldwin ..... ₩ doz. $5.00
Bonanza Improved ..... each $6.50
Dandy ..... each $7.50
Eureka Improved ..... each $20.00
Family Bay State ..... ₩ doz. $15.00
Improved Bay State ..... ₩ doz. $36.00
New Lightning ..... ₩ doz. $7.50
Reading 72 ..... ₩ doz. $4.00
Reading 78 ..... ₩ doz. $7.00
Turn Table '98 ..... ₩ doz. $6.75
White Mountain ..... ₩ doz. $6.00

Potato—
Saratoga ..... ₩ doz. $7.00
White Mountain ..... ₩ doz. $6 00

Picks and Mattocks—
List Feb. 23, 1899 ..... 70@70&10%

Pinking Irons—
See *Irons, Pinking.*

Pins— Escutcheon—
Brass ..... 60@60&10%
Iron, list Nov. 11, '85 ..... 60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in. ..... 50&10%
Extra Heavy, 2-6 in. 65%
Fittings 70%

Pipe, Merchant,
Steel Carload Lots,

f.o.b, Pittsburgh.	*Black.*	*Galvanized.*
Merchant Pipe.		
⅛, ¼, ⅜ inch	*68%*	*58%*
½-inch	*71%*	*61%*
¾ to 6 inch	*75%*	*65%*
7 to 12 inch	*71%*	*61%*

Pipe, Sewer—
Jobbers' Prices—
Standard Pipe and Fittings, 2 to 24 in.
New England 67%
New York and New Jersey 70%
Maryland, Delaware, East Penn. 73%
West Penn and West Va. 73%
Virginia 75%
Ohio, Michigan and Ky. 75%
Indiana 77%
Carload lots are generally delivered.

Pipe, Stove—
Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.50	$8 50
6 in., per 100 joints	8.10	9.00
7 in., per 100 joints	9.00	10.00

Planes and Plane Irons—
Wood Planes—
Bench, First quality .. 40&5@40&10%
Bench, Second qual. .. 50&5@50&10%
Molding ..... 33⅓&5@33⅓&10%
Bailey's (Stanley R. & L. Co) 5&10@25&10&10%
Chapin-Stephens Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality ..... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Toy and German ..... 40@40&10%
Gage Self Setting 35%
Union 60%

Iron Planes—
Bailey's (Stanley R. & L. Co) ..... 25&10@25&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10@20&10&10%
Sargent's ..... 60@60&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons ..... 50&5@50&10%
Buck Bros. 30%
Chapin-Stephens Co. ..... 30@30&10%
Stanley R. & L. Co. .. 20&10@20&10&10%
L. & L. J. White ..... 20&5@25%

Planters, Corn, Hand.
Kohler's Eclipse ..... ₩ doz. $8.50

Plates—
Felloe ..... lb. 3¼@4c
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $2.00 ..... 50%

Pliers and Nippers—
Button Pliers ..... 75@75&10%
Gas Burner, per doz., 5 in., $1.25@ $1.30; 6 in., $1.45@$1.50
Gas Pipe .. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers ..... 50@50&5%
Bernard's:
Cutting Nippers 33⅓%
Parallel, Pliers 33⅓%
Paragon Pliers 50%
Lodi Pliers 50%
Elm City Fence Pliers 33⅓%
Cronk & Carrier Mfg. Co.:
American Button ..... 75&10%
Cronk's 60%
Improved Button ..... 70&10%
Stub's Pattern 50%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers, and Rasps ..... 40&10%
Hoofs ..... 40&10&10%
P., S. & W. Tinners' Cutting Nippers. ..... 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers. 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin Stephens Co.:
Plumbs and Levels ..... 30@30&10&10%
Chapin's Imp. Brass Cor. .. 40@40&10&10%
Pocket Levels ..... 30@30&10&10%
Level Glasses ..... 60@60&10&10%
Disston's Plumbs and Levels 70%
Disston's Pocket Levels 70%
C. E. Jennings & Co.'s Iron ..... 25&10%
C. E. Jennings & Co.'s Iron, Adjustable. ..... 33⅓&10%
Stanley R. & L. Co. .. 20&10@20&10&10%

Stanley's Duplex.....20@20&10&10%
Woods' Extension.....33⅓&5

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, $8.00; No. 3, $10.00; No. 4, $12.00.....50%
Ideal.....50%

Points, Glaziers'—

Bulk and 1 lb. papers.....*lb.* 6¼c
½-lb. papers.....*lb.* 6½c
¼-lb. papers.....*lb.* 6¾c

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

Police Goods—

Manufacturers' Lists.....25@25&5%
Tower's.....25%

Polish—Metal—

Prestoline Liquid, No. 1 (¼ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ ℔ boxes, ₱ doz. $1.25; 1 ℔ boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ¼ pt. cans, ₱ doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 ℔ cans ... ₱ ℔ 10¢
Black Eagle, Liquid, ¼ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ ℔ cans, ₱ gro. $9.00
Black Kid Paste, 5 ℔ can.....each, 80.65
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ ℔ 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 ℔ pail.....each 70¢
Black Silk, ½ ℔ box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. 80.75
Black Silk, ¼ pt. liq.....₱ doz. $1.00

Poppers, Corn—

1 qt., Square.....*gro.* $9.00
1 qt., Round.....*gro.* $10.00
1½ qt., Square.....*gro.* 11.00
2 qt., Square.....*gro.* 13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts, each.....$1.30

Potato Parers—

See *Parers, Potato.*

Pots—Glue—

Enameled.....40%
Tinned.....35%

Powder—

In Canisters:
Duck, 1 lb. each.....45c
Fine Sporting, 1 lb. each.....75c
Rifle, ½-lb. each.....15c
Rifle, 1-lb. each.....25c
King's Semi-Smokeless:
Keg (25 ℔ bulk).....$6.50
Half Keg (12½ ℔ bulk).....$3.50
Quarter Keg (6¼ ℔ bulk).....$1.90
Case 24 (1 ℔ cans bulk).....$8.50
Half case (1 ℔ cans bulk).....$4.50

King's Smokeless:	Shot Gun	Rifle
Keg (25 ℔ bulk)	$12.00	$15.00
Half Keg (12½ ℔ bulk)	6.25	7.75
Quarter Keg (6¼ ℔ bulk)	3.25	4.00
Case 24 (1 ℔ cans bulk)	14.00	17.00
Half case 12 (1 ℔ cans bulk)	7.25	8.75

Robin Hood Smokeless Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@35%
Sensible.....35⅓&5
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

Seal Presses—

Morrill's No. 1, per doz. $20.00.....50%

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—

Cyclops.....50%
Duff's Improved Nail Puller.....50%
Miller's Falls, No. 3, per doz. $12.00..... 33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Peerless, ₱ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 2 B (large).....$5.50
No. 3 B (small).....$2.00
Smith & Hemenway Co.:
Ajax.....60%
Diamond B, No. 2, case lots, ₱ doz $6.00
Diamond B, No. 3, case lots, ₱ doz $5.50
Eureka.....50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15.....40%
Yankee.....66⅔%

Pulleys—Single Wheel—

Inch	2	2½	3
Awning, doz	$0.55	.85	1.15

Hay Fork, Swivel or Solid Eye..... doz., 4 in., $1.15; 5 in., $1.40

Inch	2	2¼	2½
Hot House, doz	$0.70	.90	1.25
Inch	1¼	1½	1¾ 2
Screen.....doz	$0.16	.19	.23 .30
Inch	1¼	2	2¼ 2½
Side.....doz	$0.30	.40	.56 .63
Inch	1½	1¾	2 2½
Tackle....doz	$0.30	.42	.58 1.00

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction...60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in..16@19c
Auger Mortise, no Face Plate, per doz. 1¾ and 2 in.....16@19c
Auger Mortise, with Face Plate, per doz., 1¾ and 2 in.....16@19c
Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2 in. ₱ doz 50%
Grand Rapids All Steel Noiseless....50%
Ideal.....70&5%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....80@80&10%
Wood.....50@50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch..	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch..	3	3¼	3½	3¾ 4
	$3.50	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch	2½	3	3½	4
	$2.75	3 85	5.00	6.00

Barnes Dbl. Acting (low list).... 50&10%
Contractors' Rubber Diaphragm No. 2 B. & L. Block Co.....$16.00
Daisy Spray Pump.....₱ doz. $7.20
Flint & Walling's Fast Mail (low list).55%
Flint & Walling's Pitcher Spout.....80%
National Specialty Mfg. Co., Measuring, $4.00.....80%
Mechanical Sprayer.....$7.20
Myer's Pumps, low list.....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50%

Punches—

Saddlers' or Drive, good..doz. 65@70c
Spring, single tube, good quality... $1.75@2.00
Revolving (4 tubes)...doz. $3.50@3.75
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Benard Spring Belt Punches.....33⅓%
Lodi Spring Belt Punches.....50%
Morrill's No. 1 (A.B.C.), ₱ doz., $15.00..50%
No. 2, ₱ doz. $22.50.....50%
Hercules, each $7.50.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Paragon Spring Steel Punches.....5%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

Rail—Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾	*In.*
$1.70	$2.10	$3.00	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$1.50	1 90	2.60	*100 feet.*

Sliding Door, Iron Painted..2½@2¾c
Sliding Door, Wrought Brass, 1¼ in.....lb.36c...30%
Allith Mfg. Co., No. 1, Reliable Hanger Track, ₱ foot.....8¢
Allith Mfg. Co., No. 2, Reliable Hanger Track, ₱ foot.....10¢
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3½¢
Lane's Hinged Track, ₱ 100 ft., 1 in., $3.70; 1¼ in., $4.40
Lanes' O. N. T., ₱ 100 ft., 1 inch, $3.00; 1¼ inch, $3.70; 1½ inch $4.00.
Lanes' Standard, 1¼ in., ₱ 100 ft.....4.10
Lawrence Bros., ₱ ft. 11¢.....60%
Lawrence Bros. New York.....3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11¢.....50%
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard.....₱ ft. 4¢
Myers' Stayon Track.....50&10%
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U.S. Standard.....60%
Smith's Wrought Bracket, Plain.....3½¢
Smith's Special.....4½¢
Smith's Never Jump, per ft. 11¢.....50%
Smith's Plain Steel.....30%
Smith's Milled Steel.....4½¢
Stowell's Cast Rail.....₱ ft. 18¢
Stowell's Steel Rail, Plain.....25%
Stowell's Wrought Bracket, 1 3-16 in.... ₱ ft. 3¢
Stowell's Wrought Bracket, 1½x3-16.... ₱ ft. 7¢
Swett's Hylo, per ft. 11¢.....50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $8.00

Rakes—

Net Prices, Malleable Rakes:

	10	*12*	*14*	*16-tooth*
Shank	$1.50	1.60	1.75	1.85
Socket	$1.65	1.80	1.95	2.10

Steel. Garden and Gravel, Aug. 1, '99 List.....70%
Weldless Steel.....75&5%
Malleable Iron, Garden.....70&10%
Lawn Rakes, Metal Head, per doz.
20 teeth.....$3.25@3.50
24 teeth.....$3.50@3.75
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 20 and 30 teeth, ₱ doz., net, $4.25
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3 45
Lawn Queen, 24-tooth, ₱ doz $3.60
Paragon, 20 tooth, ₱ doz $2.75
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$2.88
Malleable Garden, 14-tooth, ₱ doz..$2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5&10&5%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10@75% See also *Files.*

Razors—

Borastic.....60 & 10%
Fox Razors, No. 42, ₱ doz. $20.00
Fox Razors, No. 44, ₱ doz, $20.00
Fox Razors, No. 82, Platina, ₱ doz. $25.00 } dis. 40%
Red Devil.....60%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—

Safety Razors.....40%
New Gem, in Tin Boxes.....₱ doz. $12.00
New Gem, Extra Blades.....₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.)..... ₱ doz. $5.60
Complete Razor, extra Blade in Leather Case.....₱ doz. $27.00
Silbersein.....40%

Reels—Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz.....$30.00
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 18, Q 16, A 16, B 16, 4008, Rubber Populo, Nickeled Populo.....20%
Aluminum, German Silver, Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 0.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P.....33⅓%
2904 PN.....33⅓%
0924 N.....33⅓%
02084 N.....33⅓%
002904 PN.....33⅓%
802 N.....33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Black Jap
White Jap
Bronzed
Nickel Plated
Electro Plated
} 70&10@75 &10%

Registers, Cash—

Sun, No. 10, Metal Cabinet.....$30.00
Sun, No. 10, Wood Cabinet.....$25.00

Revolvers—

Single Action.....85@90c
Double Action, 44 cal.....$1.90
Double Action, 44 caliber.....$2.05
Automatic.....$3.60
Hammerless.....$4.10
Note.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in., per doz.....$2.25@2.50
17 in., per doz.....$2.50@2.75
18 in., per doz.....$2.75@3.00

Rings and Ringers—Bull Rings—

	2	*2½*	*3 Inch*
Steel	$0 70	0.75	0.80 doz
Copper	1.00	1.15	1.40 doz

Hog Rings and Ringers—

Hill's Rings....gro. boxes, 2¼.25@4.50
Hill's Ringers, Gray Iron, doz. 50@.55c
Hill's Ringers, Mal. Iron, doz. 70@.75c
Blair's Rings.....per gro. $5.00@5.25
Blair's Ringers...per doz. $0.60@ .65
Brown's Rings....per gro. $5.25@5.50
Brown's Ringers...per doz. $0.65@ .70

Rivets and Burrs—

Copper.....60@60&5%
Iron or Steel.....75&5@75&10%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Farn Door, Sargent's list.....60%
Cronk's Stay.....66⅔%
Cronk's Brinkerhoff.....66⅔%
Lane's Stay.....33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.00

Rope—

Manila, 7-16 in. diam. and larger, tarred or untarred.....*lb.* .. @12 c
Manila, Hay, Hide and Bale Ropes, Medium and Coarse.....*lb.* .. @12 c
Sisal, 7-16 in. diam. and larger:
Mixed.....*lb.* .. @ 8 c
Pure.....*lb.* .. @ 9¼c
Sisal. Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed.....*lb.* .. @ 8 c
Pure.....*lb.* .. @ 9¼c
Sisal, Tarred, Medium Lath Yarn:
Mixed.....*lb.* .. @ 7½c
Pure.....*lb.* .. @ 8½c
Cotton Rope:—*Lb.*—
Best.....¼-*in. and larger*..18@25c
Medium..¼-*in. and larger*..16@18c
Com.....¼-*in. and larger*..12@13c
Jute Rope:
Thread No. 1, ¼-in. and up, lb. 6 c
Thread No. 2, ¼-in. and up, lb. 5½c
Old Colony Manila Transmission Rope, ₱ ℔ 17½¢

Wire Rope—

Galvanized.....47½&5%
Plain.....55&5%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute.....40&5%
Sisal.....30%
Covert Saddlery Works.....60&5%

Rules—

Boxwood.....60&10@60&10&5%
Ivory.....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Miscellaneous.....50@50&10&10%
Combination.....55@55&10%
Stationers'.....10@10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Upson Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

Sash Locks—See *Locks, Sash*

Sash Weights—See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular.....50%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames....30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&5%
Disston's:
Circular, Solid and Inserted Tooth..50%
Band, 3 to 14 in wide.....60%
Band, ⅛ to 2½.....70%
Crosscuts.....45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 79, 77, 8.....25%
Hand Saws, Nos 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key Hole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s.:
Back Saws.....25&10%
Butcher Saws.....30&10%
Compass and Key Hole Saws.35&5&10%
Framed Wood Saws.....30&10%
Hand Saws.....20&2½&10%
Wood Saw Blades.....30&10%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace & Richardson's Hand Saws.....30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25&25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Keyhole, &c .....25@25&7½%
Wood Saws.....35@35&7½%
Wheeler, Madden & Clemson Mfg. Co.'s
Cross Cut Saws.....50%

Hack Saws—

Atkins' Hack Saw Blades A A A. ... 25%
Disston:
Concave Blades.....25%
Keystone.....40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best.....25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180..... 35&5&10%
Hack Saws, Nos. 175, 180, complete. 35&5&10%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames .. 35&5&10%
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....35%
Sterling Hack Saw Frames.....30&10&5%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scalers, Fish—

Bishop's Lightning.....₱ doz. $3.00
Covert's Saddlery Works.....60&10%

Scales—

Family, Turnbull's.....60@50&10%
Counter:
Hatch. Platform, ¼ oz to 4 lbs. doz $5.50
Two Platforms, ½ oz to 8 lbs., doz. $18
Union Platform, Plain..$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective," 25 lbs.....50%
Union or Family No. 2.....60%
Portable Platform (reduced list).....50%
Wagon or Stock (reduced list)...25@25%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing.....50%
"The Standard" Portables.....50%
"The Standard" R. R. and Wagon....50%

Scrapers—

Box, 1 Handle.....*doz. $2.00@2.25*
Box, 2 Handle.....*doz. $2.60@2.85*
Ship Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30@30&10%
Chapin-Stephens Co., Box.....50@50&10%

Screens, Window, and Frames—

Flyer Pattern Screens...60&5&60&5&2½%
Maine Screen Frames.....40&10&5%
Perfection Screens.....60&5&60&5&2½%
Phillips' Screen Frames, 60&5@30&5&2½%
Porter's:
Fairview Screens.....60&5@60&5&2½%
Hummer Screens.....60&5@60&5&2½%
Klondike Screens.....60&5@60&5&2½%
See also *Doors.*

Screws—Bench and Hand—

Bench, Iron..doz. 1 in., $2.50@2.75 :
1½, $3.00@3.25: 1¼, $3.50@3.75
Bench, Wood, Beech....doz. 30@30&5%
Hand, Wood.....30@30&5%
R. Bliss Mfg. Co, Hand.....30%
Chapin-Stephens Co., Hand.....30@30&10%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, 99.....30&5@30&10
Coach and Lag, Gimlet Point, list Oct. 1, '99.....30@30&5%
Hand Rail, list Jan. 1, '81..70&10@75%

Jack Screws—

Standard List.....75&10@30&5%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50@50&5%
Sargent.....70%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50&10%
Flat or Round Head, Brass50@50&10%

Set and Cap—

Set (Iron or Steel)70&10&5% } *Extra*
Sq. Hd. Cap.....65&10&5% } *10&10*
Hex. Hd. Cap.....65&10&5% } *often*
Rd. or Fillister Hd. Cap 60% } *given.*

Wood—

List July 23, 1903.
Manufacturers' printed discounts :
Flat Head, Iron.....87½&10@.. %
Round Head, Iron.....85&10@.... %
Flat Head, Brass .....85&10@.... %
Round Head, Brass .....80&10@.... %
Flat Head, Bronze....77½&10@.... %
Round Head, Bronze.....75&10@.. %
Drive Screws.....87½&10%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Per doz.
Clipper Pattern, Grass...$4.25@$5.00
Full Polished Clipper.....$4.75@$5.50
Grain.....$7.00@$7.50
Clipper, Grain.....$7.75@$8.25
Weed and Bush.....$4.50@$5.00

Seeders— Raisin—

Enterprise.....25@30%

Sets— Awl and Tool—

Brad Awl and Tool Sets :
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools .. doz. $3.50@3.60
Aiken's Sets, Awl and Tools :
No. 30, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders.....30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior :
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30&30&10&10%

Garden Tool Sets—

Ft. Madison, Three Pieces, Hoe, Rake and Shovel.....₱ doz. sets.....$9.00

Nail—

Square.....per gro. $2.25@2.50
Round, Blk. and Pol., assorted..... gro. $1.80@2.00
Octagon.....gro. $4.50@5.75
Buck Brothers.....37½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

Rivet—

Regular list.....70&10@75%

Saw—

Aiken's:
Genuine.....50&10%
Imitation.....50&10%
Atkin's:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.83.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal, Cross Cut .....₱ doz. $8.50
Royal, Hand.....₱ doz. $5.00
Taintor Positive.....₱ doz $6.75

Shaving—

Fox Shaving Sets, No. 30, per doz, $24.00 net

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%

Shaves, Spoke—

Iron.....doz. $1.00@1.15
Wood.....doz. $1.75@2.00
Bailey's (Stanley R. & L. Co.).....
.....20@30&10&10%
Chapin-Stephens Co .....40@30&10&10%
Goodell's, ₱ doz. $9.00.....15&10%
Wood's Fl and F2.....50%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap.....70@70&10%
" Nickel.....60@60&10%
Fair qual. Jap.....80@80&5%
" Nickel.....75@75&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears 10%
Wilkinson's Hedge .....1900 list 45%
Wilkinson's Branch, Lawn and Border.....40%
Wilkinson's Sheep .....1900 list. 50%

Tinners' Snips—

Steel Blades .....20&5@20&10
Steel Laid Blades .....40&10@50%
Forged Handles, Steel Blades, Berlin .....40@40&10%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6¼ to 10 inch .....30&7½&10%
Niagara Snips 40%
P., S & W. Co. 20%
Triumph Pipe Shear.....₱ doz. 9.00

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25%
Disston's Pruning Hook, ₱ doz, $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades.....40@40&5%
Orange Shears.....50&10@50&20%
Grape .....40&10@50%
Tree Pruners.....75%
P., S. & W. Co.....33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction 50%
Patent Roller Hatfield's, Sargent's list. .....70&10%
Reading.....50%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....50%

Sliding Shutter—

Reading list.....50%
R. & E. list.....33⅓%
Sargent's list.....50&10%

Shells—Shells, Empty—

Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.. 65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, Magic 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge.....20%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&10%
Robin Hood, High Brass.....30&10%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes Horse, Mule, &c.—

F. o. b., Pittsburg;
Iron.....per keg $3.85
Steel.....per keg 3.60
Burden's, all sizes, ₱ keg.....$3.90

Shot—

Drop, up to B, 25-lb. bag.....$1.60
Drop, B and larger, per 25-lb. bag $1.85
Buck, 25-lb. bag.....$1.85
Chilled, 25-lb. bag.....$1.85

Shovels and Spades—

Association List, Nov. 15, 1902....40%

Sieves and Sifters—

Hunter's Imitation, gro. $10.50@11.00
Buffalo Metallic tinued, S. S. Co., ₱ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

National Mfg. Co.:
Victor.....per gro. $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11 00
Shaker (Barlers Pat.) Flour Sifters. ₱ doz., $2.00.....30%

Sieves, Tin Rim—

Per dozen.

Mesh	*14*	*16*	*18*	*20*
Black, full size...	*$1.20*	*1.25*	*1.30*	*1.35*
Plated, full size..	*$1.30*	*1.35*	*1.40*	*1.45*
Black, scant....	*....*	*$6.95*	*1.00*	*1.05*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$0.90@0.95
Mesh 20, Nested, doz..... 1.00@1.05
Mesh 24, Nested, doz..... 1.30@1.40

Sinks—

Cast Iron—

Standard list.....60@60&10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Skeins, Wagon—

Cast Iron.....75@75&10%
Steel.....40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....40&10%
Noiseless Slates.....60&5 tens

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling No. 10, $2.00.....33⅓

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Derby.....30&5&2%
High Grade.....45%
Jockey.....30&10%
Trojan.....45%
Yankee.....30&5&2%
Yankee, Roller.....30&5&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
Oneida Community Solid Swivel.....60%
Sargent's Patent Guarded .....60%&10%

Snaths—

Scythe.....45%

Snips, Tinners'—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality..... 50&10@60&5%
Cheap..... 50@60&10%
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor. Rogers Brand.. .....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60&10%

Miscellaneous—

German Silver..... 60@60&5%
Cattaraugus Cutlery Co.:
Yukon Silver.....60%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 10&10%

Tinned Iron—

Teas.....per gro. 45@50c
Tables.....per gro. 90c@$1.00

Springs—Door—

Chicago (Coil).....40&10%
Gem (Coil).....20%
Reliance (Coil).....40&10%
Star (Coil).....30%
Torrey's Rod, 39 in.....₱ doz. $1.10
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider :
Black or ⅛ Bright, lb.....4¼@5 c
Bright, lb.....5¼@5½c
Painted Seat Springs :
1½ x 2 x 26, per pr.....50@55c
1½ x 2 x 28 per pr.....60@65c
1½ x 3 x 28 and narrower, per pr. 80@85c

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.... } List Jan. 5, 1900.
Steel and Iron... } 70&10@70&10&10%
Rosewood Hdl Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels. 40&10@40&10&10%
Disston's Try Sq. and T-Bevels.....70%
Winterbottom's Try and Miter..... 40&10@40&10&10%

Squeezers—Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50 ; No. 1, $6.25@$6.50.
Wood, Porcelain Lined.
Cheap.....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined.....doz. $1.75

Staples—

Barbed Blind. .....lb. 6@6½c
Electricians', Association list..... 80&10&10&10%
Fence Staples, Plain $2.25; Galvanized.....$2.55
Poultry Netting, Staples....per lb.. 3¼@3½c
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
C. & A. Hoffmann's.....40%

Steelyards.....30@30&10%

Stocks and Dies—

Blacksmiths'.....40&10@50%
Curtis Reversible Ratchet Die Stock.25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 6 inch, $3.00 per gro., 12 inch, $10.80
Norton Emery Scythe Stones:
Less than gross lots.....₱ gro. $9.00
One gross or more.....₱ gro. $7.20
Lots of 10 gross or more....₱ gro $6.00
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₱ gro. $12.00
Lamoille S. S. .....₱ gro. $11.00
White Mountain S. S....₱ gro. $9.00
Green Mountain S. S....₱ gro. $6.00
Extra Indian Pond S. S. ₱ gro. $7.50
No. 1 Indian Pond S. S..₱ gro. $7.00
No. 2 Indian Pond S. S..₱ gro. $4.50
Leader Red End S. S....₱ gro $4.50
Balance of 1901 list 33⅓% } 40%

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:

	₱ lb.
Arkansas Stone, No. 1, 3 to 5½ in.	$2.80
Arkansas Stone, No. 1, 5½ to 8 in.	$3.50
Arkansas Slips N . 1	$4.00
Lily White Washita 4 to 8 i	60c
Rosy Red Washita, 4 to 8 in	60c
Washita Stone, Extra, 4 to 8 in..	50c
Washita Stone, No. 1, 4 to 8 in..	40c
Washita Stone, No. 2, 4 to 8 in..	30c
Lily White Slips.....	90c
Rosy Red Slips.....	90c
Washita Slips, Extra.....	80c
Washita Slips, No. 1.....	70c
India Oil Stones (entire list)	33⅓%

} 33⅓%

Hindostan No. 1, Regular.... ₱ D 8¢
Hindostan No. 1 Small.....₱ D 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, 3 to 5 in. ₱ D 30¢
Queer Creek Stones, 4 to 5 in.....20¢
Queer Creek Slips.....40¢
Sand Stone.....5¢ } 40%
Belgian, German and Swaty Razor Hones.....50%
Natural Grit Carving Knife Hones, ₱ doz.....$3.00
Quick Edge Pocket Knife Hones, ₱ doz.....$3.00
Mounted Kitchen Sand Stone, ₱ doz.....$1.50 } 40%

Stoners—Cherry—

Enterprise.....25@30%

Stops, Bench—

Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%
Whipple's Combination..... ₱ doz. $2 50

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....30%

Straps—Box—

Cary's Universal, case lots....20&10&10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points....doz. 55@60c
Socket.....doz. $1.75
Excelsior Stretcher and Tack Hammer Combined, per doz. $6.....30%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, 1902.....30&5%

Sweepers, Carpet—

National Sweeper Co.:	Per doz.
Auditorium, Roller Bearing (26 in case), Nickel	$54.00
Mammoth, Roller Bearing (30 in case), Nickel	$60.00
Marion, Roller Bearing, regular finishes, full Nickel	$24.00
Marion Queen, Roller Bearing, full Nickel	$24.00
Monarch, Roller Bearing, Nickel	$22.00
Monarch, Roller Bearing, Jap'ned	$20.00
Transparent, Roller Bearing, Plate Glass Top, Nickel	$36.00
Monarch Extra, Roller Bearing, (17-inch case), Nickel	$36.00
Monarch Extra, Roller Bearing (17-inch case), Japanned	$33.00
National Queen, Fancy Veneers	$27.00
Perpetual, Regular Bearings, Nkl.	$20.00
Perpetual, Regular Bearings, Jap.	$18.00

NOTE.—*Rebates: 30c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.*

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks.....90&10&10@....%
American Cut Tacks....90&25@....%
Swedes Iron Tacks. 90&30&10&5@....%
Swedes Upholsterers' Tacks..... 90&5&10&10&5@....%
Gimp Tacks.....90&5&10@....%
Lace Tacks.....90&5&10@....%
Trimmers' Tacks..90&30&10&5@....%
Looking Glass Tacks. 70&10&5@....%
Bill Posters' and Railroad Tacks... 90&5&10@....%
Hungarian Nails ....80&30&5@....%
Common and Patent Brads..... 80&10&5@....%
Trunk and Clout Nails..80&10@....%
NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10&5% on Standard Weights.****

Miscellaneous—

Double Pointed Tacks...90 and 6 tens
Steel Wire Brads, R. & E. Mfg. Co's list.. 50&10@60%

See also *Nails, Wire.*

Tanks, Oil—

	Each.
Emerald, S. S. & Co.	30-gal $3.25
Emerald, S. S. & Co.	60-gal., $4.00
Queen City S. S. & Co., 30-gal.	$3.65
Queen City S. S. & Co., 60-gal.	$4.50

Tapes, Measuring—

American Asses' Skin.....40&10@50%
Patent Leather.....25@30&5%
Steel.....40@40&10%
Chesterman's.....25@25&5%
Eddy Asses' Skin.....40&10@50%
Eddy Patent Leather.....25@30&5%
Eddy Steel.....40@40&10%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓@35%
Lufkin's Metallic.....30@30&5%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lbs. $3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire.

Single Loop.....80&2½
Monitor, Cross Head, Etc.....70%

Brick Ties—

Niagara Brick Ties.....30&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tools—
L. & I. J. White ..... 20@20&5%

Hay—
Myers' Hay Tools 50%
Stowell's Hay Carriers 5%
Stowell's Hay Forks 50%
Stowell's Fork Pulleys 5%

Saw—
Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—
L. & I. J. White 25%

Transom Lifters—
See *Lifters, Transom.*

Traps— Fly—
Balloon, Globe or Acme ..... doz. $1.15@1.25; gro. $11.50@12.00
Harper, Champion or Paragon ..... doz. $1.25@1.50; gro. $13.00@13.50

Game—
Oneida Pattern ..... 75c&10@75c&10c&5%
Newnouse ..... 45@45&5%
Hawley & Norton ..... 65@65&5%
Victor (Oneida Pattern) ..... 75@75&5%
O.C. Jump (Blake Pattern) 60@5@60&10%

Mouse and Rat—
Mouse, Wood, Choker, doz. holes ..... 8½@9c
Mouse, Round or Square Wire ..... doz. 85@90c
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 7 $2.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00
No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00 ..... 50%
J. M Mast Mfg. Co.: Per gro.
Mouse. Rat.
Blizzard ..... No. 12, $3.00 No. 1, $9 50
Old Nick ..... No. 30, 2.22 No. 2, 8.40
Joker ..... No. 5, 2.10 No. 3, 8.40
Imp'd Snap Shot, Mouse, per gro., 2 hole, $2 40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.

Trimmers Spoke—
Bonney's Nos. 1 and 2 ..... 33⅓%
Wood's E 1 ..... 50%

Trowels—
Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 3 in. ..... ₱ gro. $5.00
Kohler's Steel Garden Trowels, 6 in. ..... ₱ gro. $6.00
Never-Break Steel Garden Trowels ..... gro. $6.00
Rose Brick and Plastering ..... 25&5%
Woodrough & McMartin, Plastering 25%

Trucks, Warehouse, &c.—
B. & L. Block Co.:
New York Pattern ..... 50&10%
Western Pattern ..... 60&10%
Handy Trucks ..... per doz. $16.00
Grocery ..... per doz. $15.00
Daisy Stove Trucks, Improved pattern ..... ₱ doz. $18.50
Model Stove Trucks ..... ₱ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$5.00*	*5.50*	*6.25*

Galvanized Wash Tubs (S. S. & Co.):

No.	1	2	3	10	20	30
Per doz., net	$5.70	6.50	7.20	6.30	7.20	8.10

Twine—Miscellaneous—

Flax Twine—	BC	B.
No. 9, ¼ and ½-lb. Balls	*..22c@24c*	
No. 12, ¼ and ½ lb. balls	*..18c@20c*	
No. 18, ¼ and ½-lb. Balls	*..16c@18c*	
No. 24, ¼ and ½-lb. Balls	*..16c@18c*	
No. 36, ¼ and ½-lb. Balls	*..15c@17c*	
Chalk Line, Cotton, ½-lb Balls		*30c*
Cotton Mops, 6, 9, 12 and 15 in. to doz		*10@12c*
Cotton Wrapping 5 Balls to lb ... according to quality		*16c@25c*
American 2-Ply Hemp, ¼ and ½-lb. Balls		*13@14c*
American 3 Ply Hemp, 1-lb. Balls		*13@14c*
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)		*9c*
India 3-Ply Hemp, 1-lb. Balls		*9c*
India 3-Ply Hemp, 1½-lb. Balls		*8c*
2, 3, 4 and 5-Ply Jute, ½-lb. Balls		*9@10c*
Mason Line, Linen, ½-lb. Balls		*16c*
No. 264 Mattress, ¼ and ½-lb Balls		*37c*
Wool, 3 to 6 ply		*5¾@6c*

Vises—
Solid Box ..... 50&10@60%

Parallel—
Athol Machine Co:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Bonney's 33⅓%
Columbian Hdw. Co 40%
Emmert Universal:
Pattern Makers' No. 1 ..... $15.00
Pattern Makers' No 2 ..... $12.50
Machinist and Tool Makers' No. 4. $12.50
Fisher & Norris Double Screw ..... 15&10%
Hollands':
Machinists' ..... 40@40&5%
Key-tone ..... 65&5@70%
Lewis Tool Co ..... 20@30%
Merrill's 20%
Miller's Falls ..... 60&10%
Parker's:
Victor ..... 20@25%
Regulars ..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe ..... 55@60%
Prentiss ..... 20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists 40%
Jewelers 33⅓%
Snediker's X. L 33⅓%
Stephens' 33⅓%

Saw Filers'—
Bonney's, No. 1, $13; No. 3, $16 ..... 40%
Disston's D 3 Clamp and Guide, ₱ doz $30 ..... 25%
Perfection Saw Clamps, ₱ doz. $8 00
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..... 45&50%

Wood Workers'—
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—
Bignall & Keeler Combination Pipe Vise 60%
Hollands' Combination Pipe ..... 60@60&5%
Parker's Combination Pipe:
87 Series 60%
187 Series ..... 60&5%
No. 870 ..... 40%

Wads—Price Per M.

B. E., 11 up	*60c*
B. E., 9 and 10	*70c*
B. E., 8	*80c*
B. E., 7	*80c*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*
Ely's B. E., 11 and larger	*$1.70@1.75*
Ely's P. E., 12 to 20	*$3.00@3.25*

Dis. 15%

Ware Hollow—
Cast Iron, Hollow—
Stove Hollow Ware:
Enameled ..... 55c&10@60%
Ground ..... 60c&10@65%
Plain or Unground ..... 65c&10@70%
Country Holloware per 100 lbs., $2 50
White Enameled Ware:
Maslin Kettles 70%
Covered Ware:
Tinned and Turned 40%
Enameled 50%
See also *Pots Glue.*

Enameled—
Agate Nickel Steel Ware ..... 50&20
Agate Nickel Steel Ware, Specials ..... 60&15%
Iron Clad Ware ..... 70&10%
Lava, Enameled ..... 40&10%
Never Break Enameled 50%

Tea Kettles—
Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45c*	*50c*	*55c*	*65c*

Steel Hollow Ware.
Avery Spiders & Griddles ..... 65@65&5%
Avery Kettles 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles 60%
Solid Steel Spiders & Griddles ..... 65&5%
Solid Steel Kettles 60%

Warmers, Foot—
Pike Mfg. Co., Soapstone ..... 40@40&10%

Washboards—
Solid Zinc: ₱ doz
Crescent, family size, bent frame. $3.00
Red Star, family size, stationary protector $3.00
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.65
Cable Cross, family size, stationary protector $2.90
Single Zinc Surface:
Naiad, familysize, open back perforated $2.40
Saginaw Globe, protector, family size, ventilated back $2.25
Brass Surface:
Brass King, Single Surface, open back $3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

Washers—
Leather, Axle—
Solid ..... 80c&10@80c&10c&10%
Patent ..... 90@90@5%
Coil: ⅞ 1 1⅛ 1¼ *Inch,*
11c 12c 13c 14c *per box*
Iron or Steel—

Size bolt	*5-16*	⅜	½	⅝	¾
Washers	*$5.10*	*4.20*	*2.90*	*2.70*	*2.50*

In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.
Cast Washers—
Over ½ inch, barrel lots, per lb. ..... 1¾@2c

Waterers, Hog—
Improved Dewey, ₱ doz $13.00

Wedges—
Oil Finish ..... lb. 2.35@2.40c

Weights
Hitching—
Covert's Saddlery Works ..... 60&10%

Sash—
Per ton, f.o.b. factory:
Eastern District $25.00
Western, Central and Southern Districts market unsettled, prices ranging from $21.00@25.00

Wheels, Well—
8-in., $1.60@1.80; 10-in., $2.00@2.25; 12-in., $2.45@2.65; 14-in., $3.00@3.25

Wire and Wire Goods—
Bright and Annealed:
6 to 9 ..... 75@75&10%
10 to 18 ..... 75c&5@75c&10c&5%
19 to 26 ..... 75c&10c&10@80c&5%
27 to 36 ..... 75c&10c&7½@80c&2½%
Galvanized:
6 to 9 ..... 70c&5@70c&10%
10 to 18 ..... 70c&5@70c&10%
19 to 26 ..... 72½@72½c&5%
27 to 36 ..... 70@70c&5%
Coppered:
6 to 9 ..... 70c&5@70c&10%
10 to 18 ..... 70c&10@70c&10c&5%
19 to 26 ..... 72½c&10@75%
27 to 36 ..... 70@70c&5%
Tinned:
6 to 14 ..... 72½c&10@75%
15 to 18 ..... 70c&10@70c&10c&5%
19 to 26 ..... 65c&10c&10@70%
27 to 36 ..... 60@60c&10%
Annealed, Steel and Tinned, on Spools ..... 70@70c&10%
Brass & Copper on Spools 60@60c&10%
Brass, list Feb. 26, '96 ..... 50%
Copper, list Feb. 26, '96 ..... 15%
Cast Steel Wire 50%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
List June 24, 1903 ..... 90@90c&10%

Wire Cloth and Netting—
Galvanized Wire Netting ..... 80c&10@80c&10c&5%
Painted Screen Cloth, per 100 ft. $1.25
Standard Galv. Hardware Grade:
Nos. 3, 2½ and 3 Mesh, sq. ft. 5c
Nos. 4 and 5 Mesh, sq. ft. 3½c
No. 6 Mesh, sq ft 3½c
No. 8 Mesh, sq ft 4c

Wire Barb—See *Trade Report.*

Wrenches—
Agricultural ..... 80c&5@80c&10c&5%
Baxter Pat'rn S Wrenches ..... 70c&5@70c&10%
Drop Forged S ..... 45@45c&5%
Acme ..... 60&10%
Alligator 70%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S ..... 35&5%
Adjustable S Pipe 40%
Brigg's Pattern ..... 30&10%
Combination Black ..... 40&5%
Combination Bright 40%
Merrick's Pattern 50%
No. 3 Pipe, Bright 55%
Boardman's 33⅓%
Coes' Genuine Knife Hdl. ..... 40&10&5&5%
Coes' Genuine Steel Hdl. ..... 40&10&5&5%
Coes' Genuine Key Model ..... 40&10&5&5%
Coes' "Mechanics' ..... 40&10&10&5&5%
Donohue's Engineer ..... 40&10%
Dudly Combination ..... 50&10&5%
Dudly Pipe ..... 50&10&5%
Dudly Adjustable Pipe ..... 40&10&5%
Eagle ..... 50&10%
Elgin Wrenches 40%
Elgin Monkey Wrench Pipe Jaws 33⅓%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots ..... 50&5%
Less than case lots 50%
Improved Pipe (W & B.) 60%
Solid Handles, P.S. & W ..... 50@50&5%
Stillson 65%
Triumph ..... 60&10%
Vulcan Chain 50%

Fruit Jar—
T & B Fruit Jar Wrenches ..... ₱ gro $9.00
Triumph Fruit Can Wrenches, ₱ gro $9.60
Triumph Fruit Jar Holders ₱ gro. $15.00

Wrought Goods—
Staples, Hooks, &c., list March 17 '92 ..... 90@90c&5%

Yokes, Neck—
Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters' .. list net

Zinc—
Sheet ..... per 100 lbs. $6.15@6.40

PAINTS, OILS AND COLORS.

White Lead, Zinc, &c.
Lead, English white, in Oil ..... 8½@ 9¼
Lead, American White, in Oil:
Lots of 500 ℔ or over ..... @ 6¼
Lots less than 500 ℔ ..... @ 7
In Barrels ..... @ 6
Lead, White, in oil, 25 ℔ tin pails, add to keg price ..... @ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price ..... @ 1½
Lead, American, Terms: For lots 12 tons and over ¼c rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.
Lead White, Dry in bbls ..... @ 6
Zinc, American, dry ..... ₱ ℔ 4½@ 4¾
Zinc, Paris, Red Seal, dry ..... @ 8½
Zinc, Paris, Green Seal, dry ..... @ 9¼
Zinc, Antwerp Red Seal, dry ..... @ 6½
Zinc, Antwerp, Green seal, dry ..... @ 8¼
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over ..... 12 @12½
Lots of less than 1 ton ..... 12¼@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over ..... 10¾@11¼
Lots of less than 1 ton ..... 11@11½
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.
Black, Carbon ..... ₱ ℔ 5 @10
Black, Drop, Amer ..... 4 @ 6
Black, Drop, Eng ..... 5 @15
Black, Ivory ..... 15 @20
Lamp, Com ..... 4 @ 6
Blue, Celestial ..... ₱ ℔ 4 @ 6
Blue, Chinese ..... 29 @32
Blue, Prussian ..... 27 @30
Blue, Ultramarine ..... 4½@15
Brown, Spanish ..... ½@ 1
Carmine, No. 40 ..... ₱ ℔ $3.50@3.75
Green, Chrome, ordinary ..... 3½@ 6
Green, Chrome, pure ..... 17 @25
Lead, red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6½
Lots less than 500 ℔ ..... @ 7
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6½
Lots less than 500 ℔ ..... @ 7
Ocher, American ..... ₱ ton $15.50@16.00
Orcher, American Golden ..... 2½@ 3
Orcher, French ..... 1½@ 2½
Orcher, Foreign Golden ..... 3 @ 4
Orange Mineral, English ..... ₱ ℔ 9 @11
Orange Mineral, French ..... 10¾@11¼
Orange Mineral, German ..... 6¾@ 9
Orange Mineral, American ..... 8 @ 8¼
Red, Indian, English ..... 4¼@ 8½
Red, Indian, American ..... 3 @ 3½
Red, Turkey, English ..... 4 @ 6
Red, Tuscan, English ..... 7 @10
Red, Venetian, Amer. ..... ₱ 100 ℔ $0.50@1.50
Red Venetian, English ..... ₱ 100 ℔ 1.25@1.75
Sienna, Italian, Burnt and Powdered ..... ₱ ℔ 3 @ 6½
Sienna, Ital., Raw, Powd ..... 3 @ 6½
Sienna, American, Raw ..... 1½@ 2
Sienna, American, Burnt and Powdered ..... ₱ ℔ 1½@ 2
Talc, French ..... ₱ ℔ 1 @ 1½
Talc, American ..... 75 @1.25
Terra Alba, French, ₱ 100 ℔ .95 @1.00
Terra Alba, English ..... 95 @1.00
Terra Alba, American No. 1 ..... 85 @85
Terra Alba, American No. 2 ..... 45 @50
Umber, Turkey, Bnt. & Pow. ₱ ℔ 2¼@ 3½
Umber, Turkey, Raw & Powd. 2 2¼@ 3½
Umber, Bnt. Amer ..... 1½@ 2
Umber, Raw, Amer ..... 1½@ 2
Yellow, Chrome ..... 12 @14
Vermilion, American Lead ..... 10 @25
Vermilion, Quicksilver, bulk ..... @70
Vermilion, Quicksilver, bags ..... @71
Vermilion, English, Import ..... 80 @85
Vermilion, Chinese ..... .80@1.00

Colors in Oil.
Black, Lampblack ..... 12 @14
Blue, Chinese ..... 36 @46
Blue, Prussian ..... 32 @40
Blue, Ultramarine ..... 12 @16
Brown, Vandyke ..... 11 @14
Green, Chrome ..... 10 @15
Green, Paris ..... @24
Sienna, Raw ..... 12 @15
Sienna, Burnt ..... 12 @15
Umber, Raw ..... 11 @14
Umber, Burnt ..... 11 @14

Miscellaneous.
Barytes, White Foreign, ... ₱ ton $17.50@20.00
Barytes Amer. floated ..... 18.50@20.00
Barytes, Crude No. 1 ..... 10.00@11.00
Chalk, in bulk ..... ₱ ton 3.00@ 3.25
Chalk, in bbls ..... ₱ 100 ℔ ..@ 35
China Clay, English ..... ₱ ton 11.00@17.00
Cobalt, Oxide ..... ₱ 100 ℔ 2.50@ ...
Whiting, Common ..... ₱ 100 ℔ .45@ .48
Whiting, Gliders ..... .55@ .57
Whiting, extra Gliders' ..... .58@ .60

Putty.
In bladders ..... 13@2¼
In bulk ..... 1¾@2
In cans 1 ℔ to 5 ℔ ..... 2¼@4¼
In cans 12 ½ ℔ to 25 ℔ ..... 1¾@2¼

Spirits Turpentine.
In Oil bbls ..... 63 @63½
In machine bbls ..... 63½@64

Glue.
Cabinet ..... ₱ ℔ 11 @15
Common Bone ..... 6 @ 8
Extra White ..... 18 @24
Foot Stock, White ..... 11 @14
Foot Stock, Brown ..... 7 @10
German Hides ..... 12 @18
French ..... 10 @40
Irish ..... 13 @16
Low Grade ..... 8 @11
Medium White ..... 14 @17

Gum Shellac— Cts per lb.
Bleached, Commercial ..... 40 @..
Button ..... 40 @45
Diamond I ..... 38 @..
Fine Orange ..... 30 @35
A. C. Garnet ..... 40 @44
D. C ..... 35 @..
T. N ..... 44 @47
V. S. O ..... 60 @63

Animal, Fish and Vegetable Oils.
Linseed, City, raw ..... ₱ gal. 42 @43
Linseed, City, boiled ..... 44 @45
Linseed, State and West'n, raw 39 @41
Linseed, raw Calcutta seed ..... @65
Lard, Prime, Winter ..... 63 @64
Lard, Extra No. 1 ..... 52 @53
Lard, No. 2 ..... 40 @41
Cotton-seed, Crude, f.o.b mills 31½@33
Cotton-seed, Summer Yellow, prime ..... 37½@38
Cotton-seed Summer Yellow, off grades ..... 37 @37½
Sperm, Crude ..... @..
Sperm, Natural Spring ..... 61 @64
Sperm, Bleached Spring ..... 63 @66
Sperm, Natural Winter ..... 65 @66
Sperm, Bleached Winter ..... 67 @70
Tallow, Prime ..... 50 @51
Whale, Crude ..... @..
Whale, Natural Winter ..... 46 @47
Whale Bleached Winter ..... 48 @51
Menhaden, Brown, Strained ..... 31 @33
Menhaden, Light Strained ..... 32 @34
Menhaden, Bleached Winter ..... 34 @36
Menhaden, Ex Bleached Winter 38 @37
Cocoanut, Ceylon ..... 6½@ 7
Cocoanut, Cochin ..... 7½@ 7¾
Cod, Domestic ..... 39 @40
Cod, Newfoundland ..... 40 @41
Red Elaine ..... 44 @45
Red Saponified ..... ₱ ℔ 5½@ 5¾
Olive, Italian, bbls ..... 50 @ 52
Neatsfoot prime ..... 51 @ ..
Palm, prime, Lagos ..... ₱ ℔ 6¼@ 6¾

Mineral Oils.
Black, 20 gravity, 25@30 cold test ..... ₱ gal. 13 @14
Black, 29 gravity, 15 cold test. 14 @15
Black, Summer ..... 13 @14
Cylinder, light filtered ..... 20@22½
Cylinder, dark filtered ..... 18@21½
Paraffine, 903-907 gravity ..... 15 @17½
Paraffine, 903 gravity ..... 14 @14½
Paraffine, 885 gravity ..... 11¾@12½
Paraffine, red ..... 14 @15¾
In small lots ½c advance.

CURRENT METAL PRICES.

MARCH 16, 1904.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:
1 to 1⅜ in. round and square..... ₩ lb .... @1.80¢
1½ to 4 in. x ⅛ to 1 in..... ₩ lb .... @2.00¢
1¼ to 4 in. x ¼ to 5-16..... ₩ lb .... @2.00¢
Rods—¾ and 11-16 round and square. ₩ lb .... @2.00¢
Angles: Cts ₩ lb
3 in. x ¼ in. and larger..... 2.15¢
3 in. x 3-16 in and ⅓ in..... 2.25¢
1¼ to 2½ in. x ¼ in..... 2.05¢
2¼ to 2¾ in. x 3-16 in and thicker..... 2.00¢
1 to 1¼ in. x 3-16 in..... 2.05¢
1 to 1¼ x ⅓ in..... 2.10¢
⅞ x ⅓ in..... 2.25¢
½ x ⅓ in..... 2.35¢
½ x ⅓ in..... 3.15¢
⅜ x 3-32 in..... 3.65¢
Tees:
1 in..... 2.45¢
1¼ in..... 2.25¢
1¾ to 2½ in..... 2.15¢
3 in. and larger..... 2.40¢
Beams..... 2.35¢
Channels, 3 in. and larger..... 2.35¢
Bands—1¼ to 6 x 3-16 to No. 8..... ₩ lb 2.10¢
"Burden's Best" Iron, base price..... ₩ lb 3.05¢
Burden's "H. B & S. Iron, base price..... ₩ lb 2.85¢
"Ulster"..... ₩ lb 3.10¢
Norway Bars..... 3.25@3.75¢
Norway Shapes..... 3.75@4.25¢

Merchant Steel from Store—

per lb
Bessemer Machinery..... 1.85¢
Toe Calk, Tire and Sleigh Shoe..... 2.00@2.50¢
Best Cast Steel, base price in small lots..... 7¢

Soft Steel Sheets—

¼ inch	2.30¢	No. 14	2.45¢
5-16 inch	2.30¢	No. 16	2.55¢
No. 8	2.30¢	No. 18	2.65¢
No. 10	2.35¢	No. 20	2.65¢
No. 12	2.40¢	No. 22	2.70¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel	R. G. Cleaned.
No. 14	₩ lb 2.35	2.50¢
No. 16	₩ lb 2.45	2.60¢
Nos. 18 to 21	₩ lb 2.55	2.70¢
Nos. 22 to 24	₩ lb 2.60	2.80¢
Nos. 25 and 26	₩ lb 2.65	2.90¢
No. 27	₩ lb 2.70	3.00¢
No. 28	₩ lb 2.80	3.10¢

Russia, Planished, &c.

Genuine Russia, according to assortment..... ₩ lb 11½@14¢
Patent Planished..... ₩ lb A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16 ..... ₩ lb, 2.93¢
Nos. 18 to 20..... ₩ lb, 3.17¢
Nos. 22 to 24..... ₩ lb, 3.41¢
No. 26..... ₩ lb, 3.66¢
No. 27..... ₩ lb, 3.90¢
No. 28..... ₩ lb, 4.15¢
No. 30..... ₩ lb, 5.12¢
No. 20 and lighter, 36 inches wide, 25¢ higher.

Foreign Steel from Store—

Best Cast..... ₩ lb 15 ¢
Extra Cast..... ₩ lb 18 @ 20 ¢
Swaged, Cast..... ₩ lb 16 ¢
Best Double Shear..... ₩ lb 15 ¢
Blister, 1st quality..... ₩ lb 13 ¢
German Steel, Best..... ₩ lb 10 ¢
2d quality..... ₩ lb 9 ¢
3d quality..... ₩ lb 8 ¢
Sheet Cast Steel, 1st quality..... ₩ lb 15 ¢
2d quality..... ₩ lb 14 ¢
3d quality..... ₩ lb 13 ¢
R. Mushet's "Special"..... ₩ lb 46 ¢
" "Titanic"..... ₩ lb 19 ¢
Robson's Choice XX Extra Best..... ₩ lb 85 ¢
Jessop Self Hardening..... ₩ lb 45 ¢
Seamans' "Nelson" Steel..... 40 ¢
Robson's "Soho" Special Self-Hardening.. ₩ lb 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per lb
Banca, Pigs	@29½¢
Straits, Pigs	@29½¢
Straits in Bars	29½@30½¢

Tin Plates—

American Charcoal Plates.

Collard Grade:
IC, 14 x 20..... $6.35
IX, 14 x 20..... 7.85
Kelyn Grade:
IC, 14 x 20..... 6.10
IX, 14 x 20..... 7.35
Allaway Grade:
IC, 14 x 20..... 5.10
IX, 14 x 20..... 6.20

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 108 lb $4 20
IX, 14 x 20..... $5.20

American Terne Plates—

IC, 20 x 28..... $8.30
IX, 20 x 28..... $10.30

Copper—

Duty: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

Ingot—

Lake..... 13½@13¾¢
Casting..... 13 @13¼¢

Sheet and Bolt—

October 22, 1903. Net

Prices, in cents per pound.

Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	36 oz. to 64 oz. 25 to 50 lb.	24 oz. to 36 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7¾ to 9½ lb.	8 oz. and 9 oz. 6¼ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	28	19	19	19	20	21	22	25	28
30	96	72	28	19	19	19	20	22	25	28	
30	.....	96	28	19	19	19	21	25			
36	72	.....	28	19	19	19	21	23	26	29	
36	96	72	28	19	19	19	21	25	28		
36	120	96	28	19	19	20	22				
36	.....	120	28	19	18	21					
48	72	.....	28	19	18	21	23	26	29		
48	96	72	28	19	18	22	24	27			
48	120	96	28	19	21	23	27				
48	.....	120	28	20	22	25					
60	72	.....	28	19	20	22	25	30			
60	96	72	28	19	21	23	28				
60	120	96	28	20	22	25					
60	.....	120	28	21	23	27					
72	96	.....	28	22	22	27					
72	120	96	28	21	24	29					
72	.....	120	29	22	27						
108	96	.....	29	22	25						
108	120	96	30	23	26						
108	.....	120	31	24	28						
wider than 108	132	.....	32	25							
	.....	132	33	24							

Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper, 20 in. wide and under, 1¢ ₩ lb advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₩ lb advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb ..... 23¢
12 oz. and up to 14 oz. to square foot, ₩ lb ..... 24¢
10 oz. and up to 12 oz., ₩ lb ..... 26¢
Lighter than 10 oz., ₩ lb ..... 29¢
Circles less than 8 in. diameter, 2¢ ₩ lb additional
Circles over 13 in. diameter are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1¢ ₩ lb extra.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.
Last Feb. 24, 1904.

Nos.	0000 to 8 Base	9 and 10		11 and 12
		⅛¢		⅛¢ ₩ lb adv.
Nos.	13	14	15	16
	¼¢	⅜¢	½	1¼¢ ₩ lb adv.
Nos.	17	18	19	20
	1¼¢	2¢	2½¢	3½¢ ₩ lb adv

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Nov. 2, 1903. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	2- 9	...	.....	...	.....	...	.....	...	.....	...	.....	18	18
12	10	...	.....	...	.....	...	.....	24	24	23	23	18	18
13	11	...	.....	...	.....	...	.....	25	25	23	23	18	18
14	12	...	.....	...	.....	25	25	25	23	23	23	19	19
15	13	...	.....	...	26	25	25	25	23	23	23	19	19
16	14	...	.....	26	26	25	25	25	23	23	23	20	20
17	15	...	29	26	26	25	25	25	23	23	23	21	21
18	16	49	31	27	27	26	26	26	24	24	24	22	22
19	17	48	31	27	27	26	26	26	24	24	24	23	23
20	18-19	50	31	27	27	26	26	26	24	24	24	24	24
21	20	68	47	29	28	28	26	25	25	25	25	25	25
22	21	67	52	31	31	30	29	27	26	26	26	26	26
23	22	71	57	33	33	31	31	29	29	29	29	29	29
24	23	77	62	42	44	42	41	42	39	37	36	36	37
25	24	82	67	52	47	45	43	42	41	40	40	41	42

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	30	27	21	21	21	21	21	21	21	23	25	27	28	₩ lb

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) Jan. 6, 1898.
Brown & Sharpe's gauge standard.

	Per lb.
Plain Round Tube, ¼ in. up to 2 in.	$0.35
" " ⅜ " ¾ "	.36
" " ½ " ¾ "	.38
" " ⅝ " ¾ "	.41
" " ¾ " ¾ "	.45
" " 5-16 " ¾ "	.48
" " ¼ " 5-16"	.65
" " 3-16 " ⅜ "	1.00
" " ¼ " 3-16"	1.50
Smaller than ⅛ inch	Special
2 inch to 3 in. inclusive, to No. 19, inclusive	.38
3 inch	.40
Over 3 inch to 3½ inch, inclusive	.45
Over 3½ inch	.50
Bronze and Copper, advance on Brass List, 3 cents.	
Discount from list	25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass Wider than and including	in. 2 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24
To No. 20 inclusive	.23	.23	.25	.27	.29	.31	.33
Nos. 21 22, 23 and 24	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36

Common High Brass Wider than and including	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40	in. 40
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.
Add 1¢ ₩ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 25%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilding bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.78	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 2½; Copper Wire, Net. List November 16, 96.
Spring Wire, 2¢ ₩ lb advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb, net..... 18¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb net, 19¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb
Western Spelter..... 5¼@5⅝¢

Zinc.

Duty: Sheet, 3¢ ₩ lb.
No. 9, base, casks.... 6¼¢ | Open per, lb..... 7¼¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.
American Pig..... 5@5¼¢
Bar..... 5¼@6¢
Pipe..... ₩ lb 5@5¼¢
Tin Lined Pipe..... ₩ lb 12¢
Block Tin Pipe..... ₩ lb 40 ¢
Sheet Lead..... ₩ lb 5¼@6 ¢
Old Lead in exchange, 3½¢ ₩ lb

Solder.

½ & ¼ guaranteed..... 18½@19 ¢
No. 1..... 16½@17 ¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.
Cookson..... ₩ lb 8¾@9 ¢
U. S..... 6¼@6¾¢
Hungarian..... 6¼@6 ¢

Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods 13¢ ₩ lb.
No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots..... ₩ lb 37¢
100-lb lots..... ₩ lb 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots..... ₩ lb 34¢
100-lb lots..... ₩ lb 33¢
Aluminum Sheet, B. & S. gauge. 50 lb or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ lb.	₩ lb.	₩ lb.
Nos. 13 to 19	$0.43	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ lb 40¢	No. 15	₩ lb 43¢
No. 9 to No. 10	₩ lb 40½¢	No. 17	₩ lb 50¢
No. 11	₩ lb 41 ¢	No. 18	₩ lb 55¢
No 12	₩ lb 41½¢	No. 19	₩ lb 60¢
No. 13	₩ lb 42 ¢	No. 20	₩ lb 65¢
No 14	₩ lb 42½¢	No. 21	₩ lb 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ lb 10¼¢
Light and Tinned Copper	₩ lb 9 ¢
Heavy Brass	₩ lb 7½¢
Light Brass	₩ lb 5½¢
Lead	₩ lb 4½¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 3½¢
No. 1 Pewter	₩ lb 17 ¢
No. 2 Pewter	₩ lb 8 ¢
Pure Aluminum, Sheet, ₩ lb	21¢
Cast Aluminum, ₩ lb	16¢
Tin Plate scrap	₩ ton $4 50@5 00
Wrought Scrap Iron	₩ gross ton $12.00@12.50
Heavy Cast scrap	₩ gross ton $11.00@11 50
Stove Plate Scrap	₩ gross ton $8.50@ 9.00
Burnt Iron	₩ gross ton $5.50@ 6.00